Memoirs of the Museum of Comparative Zoölogy
AT HARVARD COLLEGE.
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CATALOGUE OF RECENT OPHIURANS:

BASED ON THE COLLECTION OF THE MUSEUM OF COMPARATIVE ZOÖLOGY.

BY

HUBERT LYMAN CLARK.

WITH TWENTY PLATES.

CAMBRIDGE, U. S. A.:
Printed for the Museum.
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INTRODUCTION.

On July 17, 1865, there appeared, as the first quarto publication of the Museum of Comparative Zoölogy, an illustrated catalogue of the collection of ophiurans, prepared by Theodore Lyman. This catalogue, and his subsequent publications, made Mr. Lyman the world's authority on that group of animals and led to the accumulation in the Museum of an extraordinary amount of material illustrative of the group. After Mr. Lyman's death in 1897 Mr. Agassiz continued to add to the collection, and during the past ten years exchanges with various museums have greatly increased the number of species represented. It seems particularly desirable therefore that a catalogue of this collection as it is today should be published this year as a fitting recognition of the fiftieth anniversary of Mr. Lyman's important contribution to science.

Since the collection of ophiurans contains representatives of more than half the known species, it has seemed worth while to also include in this catalogue all of the species not represented in the collection and thus bring together in one volume all the known living ophiurans. It has not been possible to include any reference to the Fossil forms. While this is to be regretted, knowledge of those forms is still too incomplete to make their inclusion essential to a proper arrangement of the groups. Indeed our knowledge of the comparative morphology of the Recent ophiurans is still so imperfect that it will be some time before their interrelationships are well understood. But a great step forward has been taken by Mr. H. Matsumoto in his recently published paper, A new classification of the Ophiuroidea (Proc. Acad. nat. sci. Philadelphia, 1915). In the main, this new classification has been adopted in the present paper since it seems to be based upon careful deductions from comparative morphology. It must not be inferred that in those instances where I have not followed Matsumoto, I indicate a belief that he is wrong. It merely

shows that I have not yet satisfied myself as to the relationships of certain genera and species. In these cases, notably in regard to the genus Ophioconis and its allies, the evidence is perplexing and more light is necessary. The families Ophiacanthidae, Amphiuridae, and Ophiolepididae require detailed and careful revision, while all the large genera (Ophiacantha, Amphiura, Ophiothrix, Ophiura, etc.) need to be analysed and separated into much smaller groups than has yet been done. Verrill made a good start with Ophiacantha and Amphiura, and Matsumoto has begun on Ophiura but Ophiothrix is untouched, and even the work done by the two authors mentioned, is preliminary.

While following Matsumoto's classification, I have not included any of his subfamilies, since the number of genera is not large in any of the twelve families recognized, and therefore numerous subfamilies are inconvenient. Nor have I recognized any subdivision of species. No doubt we shall ultimately recognize subspecies, and even prior to the present time some well-marked "varieties" have been named and described, but we have not yet sufficiently well-defined genera and species to make any extensive recognition of varieties profitable.

The present catalogue gives under each family heading, the genera represented in the M. C. Z. collection, arranged with some reference to their possible phylogenetic relationship. Under each generic heading is given the reference to author, date, and place of publication, the type-species, and a brief statement as to how and when the type-species was selected. There then follows an alphabetical list of the species in the M. C. Z. collection. Under each species is given the author and date and place of first publication, and also the author, date, and place of the accepted combination. There then follows the number of specimens in the collection and the localities from which they come. When type material is in the collection, it is so stated. Type localities are printed in small capitals. Many of the older specimens have only general locality labels, such as "Australia" or "West Indies"; when we also have specimens from a definite locality within the larger area, the existence of these older specimens may be inferred from a foot-note on the page, "without definite locality."

Fifty-three new species are described as it seems desirable to assign all specimens in the collection to some species, and Mr. Lyman had left a considerable number of unique specimens unnamed. Fifteen of the new species are based on material gathered during my recent Australian journey under the auspices of the Carnegie Institution of Washington. Dr. A. G. Mayer, the official head of the party, has very kindly consented to the publication of these

new species in the present connection. For this favor, I offer him my sincere thanks. Six new genera are proposed and a few preoccupied specific names are replaced. The derivations of the new names selected are given, except when they are perfectly obvious (as *parva*, *hybrida*, etc.), and the reason for the selection of the name is also referred to in the text.

At the end of each genus, there is a list of the species, not represented in the M. C. Z. collection. In this list are included all properly described species, which seem referable to the genus. When my opinion differs from that of the author of the species, the genus in which he placed the form is given in parentheses. The type locality is also given. I have included in these lists many species whose status is open to doubt, but all *nomina nuda*, all species positively not identifiable, and all nominal species, which are doubtless synonyms of previously described species are omitted. At the end of each family is given a list of the genera, not in the M. C. Z. collection, and of their component species.

This catalogue is a list of all ophiurans described up to January 1, 1915. It is too much to expect that there are no omissions whatever but a serious attempt has been made to have the list complete. While no synonymy is given in the main body of the text, the indexes are supposed to include every generic and specific name hitherto given to Recent ophiurans. By means of these indexes, the present status of any genus or species can be promptly determined. It is hoped that this brief and compact arrangement will make the catalogue of real value.

Photographic illustrations of the new species described are given and to these are added similar figures of many species hitherto described but not figured. References to figures, when such already exist, will be found under each species; absence of such a reference indicates that the species has never been figured. Colored figures are remarkably rare. Mr. Lyman gave thirteen in his Catalogue of fifty years ago and Koehler has some equally fine ones in his Princesse-Alice Echinodermes. All of these are referred to under the proper species. The colored figures published by Herklots in 1869 do not seem sufficiently accurate, with one or two exceptions, to warrant reference to them; they may represent accurately the specimens drawn but they are not representative of the species.

Finally, it is interesting to compare our present knowledge of ophiurans with that of fifty years ago, before any deep water collecting had been done. In 1865, Mr. Lyman listed 183 species of which 102 were in the M. C. Z. collection. These species were grouped in thirty-three genera, of which all but one are still recognized as valid generic groups, although the limits are in some cases much

more restricted at present. Today we find there are 1,412 species to be listed, grouped in 189 genera. Of these, 753 species are represented in the M. C. Z. collection, which includes more than 21,000 specimens, while 659 species are wanting. Of the genera, we have 140, while forty-nine are desiderata. The Museum collection contains the holotypes of 171 species and paratypes or cotypes of 325 others. We thus have type material of more than one third of all Recent ophiurans. Mr. Lyman was himself the describer of 297 of the species here listed. Since his death, Dr. Koehler of the University of Lyons has become our great authority on the group and in his numerous and valuable reports, he has described for the first time 361 species. I cannot refrain from adding that the quality of Dr. Koehler's publications is even more remarkable than their volume, and I have had occasions every day during the preparation of this catalogue to be grateful to him for his bibliographies and synonymies, his accurate and complete descriptions, and his reliable figures.

PHRYNOPHIURIDA.

OPHIOMYXIDAE.

Ophiomyxa.

Müller and Troschel, 1842. Syst. Ast., p. 84, 108.

Type-species: *Ophiura pentagona* Lamarck, 1816. Anim. sans Vert., **2**, p. 546. Monotypic when established.

1. O. ANISACANTHA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 271, f. 136.

7 paratypes. Japan: Suno Saki, 83–158 fms.; Suruga Gulf, 108–131 fms.

2. O. AUSTRALIS Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 99. Plate **1**, f. 1, 2.

28 specimens. Fiji Islands. Caroline Islands: Ponape. Japan: Suno Saki, 41–50 fms. Australia[1]: N. S. W.: Port Jackson. Bass Strait, off East Moncoeur Island, 38–40 fms. Victoria: Westernport. Mauritius: Fouquet Reef.

3. O. BENGALENSIS Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 363, pl. 9, f. 70–71.

1 cotype. Andaman Islands, 173–250 fms.

[1] Without definite locality.

4. O. BREVIRIMA, sp. nov. (*brevis*, short + *rima*, cleft). Plate 1, f. 3, 4.

Disk, 22 mm. in diameter; arms, 70 mm. long. Similar to *australis*, except that the radial shields are very small, the genital slits are relatively much shorter (hence the name) and the arm-spines are fewer and differently arranged. The radial shields are less than .20 of the disk-diameter, while in *australis* they are .20–.25. The genital slits extend nearly to the fourth arm-joint, while in *australis*, they extend nearly or quite to the fifth. There are only three or four arm-spines (*australis* has five or six); on most joints there are three short, blunt subequal spines while on every third, or frequently on every second joint, there is a fourth, stouter spine situated at the upper (aboral) end of the series. The color of these dry specimens is yellow-brown; in one, the arms are faintly banded.

HOLOTYPE (M. C. Z. 2680) and 3 PARATYPES (M. C. Z. 2681) New Zealand: OTAGO HARBOR.

These specimens were received in exchange from the Otago University Museum, in 1907. Although superficially much like *australis*, the very characteristic arrangement of the arm-spines forbids considering them representatives of that species, which has been recorded hitherto several times from New Zealand. Further investigation will be necessary to show whether all New Zealand specimens should be referred to *brevirima*, or whether both species occur there. The new species shows no close relationship to any other member of the genus, but is perhaps nearest to *vivipara* of subantarctic distribution.

5. O. FLACCIDA (SAY).

Ophiura flaccida SAY, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 151.
Ophiomyxa flaccida LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 79, 138. LYMAN, 1865. Illus. cat. M. C. Z., no. 1, pl. 2, f. 6 (colored).

74 specimens. Bermuda[1]: Fairyland Bay. FLORIDA[1]: West Coast; Cape Florida; Key West; off the Tortugas, 36–101 fms.; off French Reef, 45 fms.; off Sombrero Key, 103 fms. Cuba: off Havana, 175 fms. Haiti[1]: Caymites. Jamaica[1]: Montego Bay. St. Thomas, D. W. I. Brazil: Bahia.

6. O. PANAMENSIS LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 182, pl. 7, f. 1–3.

2 COTYPES. PANAMA.

7. O. PENTAGONA (LAMARCK).

Ophiura pentagona LAMARCK, 1816. Anim. sans Vert., **2**, p. 546.
Ophiomyxa pentagona MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 108.

72 specimens. Nice. Naples. Trieste. Algeria: Algiers.

[1] Without definite locality.

8. O. SERPENTARIA Lyman, 1883. Bull. M. C. Z., **10**, p. 274, pl. 8, f. 114–116.

Fragments of an arm of the HOLOTYPE. BETWEEN THE FAROE ISLANDS AND THE HEBRIDES, 363 fms.

9. O. TUMIDA Lyman, 1883. Bull. M. C. Z., **10**, p. 272, pl. 1, f. 1–3.

HOLOTYPE and 149 PARATYPES. Off GEORGIA, 257–262 fms. WEST INDIES[1]: off Cuba (west end) 300 fms.; off St. Cruz, D. W. I., 115–218 fms.; off St. Kitts, 208–250 fms.; off Montserrat, 85–148 fms.; off Guadeloupe, 62–277 fms.; off Dominica, 118 fms.; off Martinique, 96–334 fms.; off St. Lucia, 116 fms.; off St. Vincent, 95–124 fms.; off Carriacou, 163 fms.; off Grenada, 159–170 fms.; off Barbados, 13–288 fms.

10. O. VIVIPARA Studer, 1876. Monatsb. K.-Preus. akad. wiss. Berlin, p. 462. Plate **2**, f. 1, 2.

6 specimens. STRAIT OF MAGELLAN, 56 fms. Cape Colony: Agulhas Bank, 150 fms.

Species of Ophiomyxa not represented in the M. C. Z.

11. O. BREVICAUDA Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 66, pl. 3, f. 3. Cuba: off Havana, 110–200 fms.
12. O. BREVISPINA von Martens, 1870. Arch. naturg., **36**, p. 249. Döderlein, 1897. Semon's Zool. forsch., **5**, p. 298, pl. 17, f. 27–27a. Amboina.
13. O. COMPACTA (Koehler), 1905. Siboga-exp. Oph. litt., p. 120, pl. 14, f. 1, 2 (*Ophiodera*). Dutch East Indies. Pulu Kaniungan Ketjil, 6 fms.
14. O. IRREGULARIS Koehler, 1898. Bull. sci., **31**, p. 110. 1905. Siboga-exp. Oph. litt., p. 119, pl. 12, f. 1. Ceylon and Andaman Islands, 28–36 fms.
15. O. LONGIPEDA Brock, 1888. Zeits. f. wiss. zool., **47**, p. 531. Amboina.
16. O. NEGLECTA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 153, pl. 28, f. 6, 7 (*Ophiodera*). Dutch East Indies, 260–330 fms.
17. O. ROBILLARDI de Loriol, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, p. 53, pl. 25, f. 5. Mauritius.

OPHIOBYRSA.

Lyman, 1878. Bull. M. C. Z., **5**, p. 131.

Type-species: *Ophiobyrsa rudis* Lyman, 1878. *loc. cit.* Monotypic when established.

18. O. ACANTHINOBRACHIA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 269, f. 134.

2 PARATYPES. Japan: SOUTHWEST OF GOTO ISLANDS, 95 fms.

19. O. HYSTRICIS Lyman, 1883. Bull. M. C. Z., **10**, p. 272, pl. 8, f. 120–122.

2 specimens, and some fragments of the HOLOTYPE. Off southwestern Ireland, 320–372 fms. The holotype was taken NORTHWEST OF THE SHETLAND ISLANDS, 345 fms.

[1] Without definite locality.

20. O. PERRIERI Lyman, 1883. Bull. M. C. Z., **10**, p. 271, pl. 2, f. 4–6.

Holotype. Cuba: off Santiago, 288 fms.

21. O. RUDIS Lyman, 1878. Bull. M. C. Z., **5**, p. 131, pl. 8, f. 198–200.

1 cotype. Victoria: off Port Philip, 38 fms.

22. O. SERPENS Lyman, 1883. Bull. M. C. Z., **10**, p. 271, pl. 8, f. 117–119.

2 specimens, including the holotype. Off Barbados, 69 fms. Off St. Cruz, D. W. I., 115 fms.

Species of Ophiobyrsa not represented in the M. C. Z.

23. O. ERINACEA (Koehler), 1904. Siboga-Exp. Oph. mer. prof., p. 152, pl. 26, f. 8, 9 (*Ophiobyrsella*). Sulu Archipelago, 150 fms.

24. O. SYNAPTACANTHA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 270, f. 135. Eastern Sea, 152 fms.

Ophiobrachion.

Lyman, 1883. Bull. M. C. Z., **10**, p. 278.

Type-species: *Ophiobrachion uncinatus* Lyman, 1883. *loc. cit.* Monotypic.

25. O. UNCINATUS Lyman, 1883. Bull. M. C. Z., **10**, p. 278, pl. 8, f. 128–131.

Holotype. Off south side of Cuba, 250 fms.

Ophiogeron.

Lyman, 1878. Bull. M. C. Z., **5**, p. 161.

Type-species: *Ophiogeron edentulus* Lyman, 1878. *loc. cit.* Monotypic when established.

26. O. EDENTULUS Lyman, 1878. *loc. cit.*, p. 161, pl. 7, f. 187–189.

1 cotype. Near Fiji Islands, 1350 fms.

27. O. SUPINUS Lyman, 1883. Bull. M. C. Z., **10**, p. 270, pl. 7, f. 103–107.

Holotype and 2 paratypes. Off St. Kitts, 208 fms. Off Barbados, 200 fms.

Ophiosciasma.

Lyman, 1878. Bull. M. C. Z., **5**, p. 160.

Type-species: *Ophiosciasma attenuatum* Lyman, 1878. *loc. cit.* Monotypic when established.

28. O. GRANULATUM Lyman, 1883. Bull. M. C. Z., **10**, p. 269, pl. 7, f. 99–102.

5 specimens, including holotype and 1 cotype. Jamaica: off Port Royal, 100 fms. Off Martinique, 96 fms. Off Barbados, 94 fms.

Species of Ophiosciasma not represented in the M. C. Z.

29. O. ATTENUATUM Lyman, 1878. Bull. M. C. Z., **5**, p. 160, pl. 7, f. 193–195. Off eastern Brazil, 350 fms.

Ophiocynodus.

H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 274.

Type-species: *Ophiocynodus corynetes* H. L. Clark, 1911. *loc. cit.* Monotypic.

30. O. CORYNETES H. L. Clark, 1911. Bull. 75 U. S. N. M., f. 138.

1 PARATYPE. Off Washington (47° 29′ N. × 125° 33′ 30″ W.), 685 fms.

Ophiosyzygus.

H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 275.

Type-species: *Ophiosyzygus disacanthus* H. L. Clark, 1911. *op. cit.*, p. 276. Monotypic.

31. O. DISACANTHUS H. L. Clark, 1911. Bull. 75 U. S. N. M., f. 139.

1 PARATYPE. Japan: off Kagoshima Gulf, 103 fms.

Ophiophrixus.

H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 272.

Type-species: *Ophiophrixus acanthinus* H. L. Clark, 1911. *op. cit.*, p. 273. Monotypic when established.

32. O. QUADRISPINOSUS (Koehler).
Ophiobyrsella quadrispinosa Koehler, 1914. Bull. 84 U. S. N. M., p. 125, pl. 16, f. 2, 3.

1 specimen. Off St. Vincent, 114 fms.

Species of Ophiophrixus not represented in the M. C. Z.

33. O. ACANTHINUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 273, f. 137. Japan: Hondo Island, off Seno Umi, 94–150 fms.

Ophioscolex.

Müller and Troschel, 1842. Syst. Ast., p. 84, 109.

Type-species: *Ophioscolex glacialis* Müller and Troschel, 1842. *op. cit.*, p. 109. Monotypic when established.

34. O. DENTATUS Lyman, 1878. Bull. M. C. Z., **5**, p. 157, pl. 7, f. 184–186.

3 COTYPES. Cape Colony: Agulhas Bank, 150 fms.

35. O. DISACANTHUS, sp. nov. (*δίς*, twice + *ἄκανθα*, spine). Plate 2, f. 3, 4.

Disk 13 mm. in diameter; arms about 40 mm. long. Similar to *purpureus* but differing in the number and arrangement of the oral papillae and in the number of arm-spines. The oral papillae are seven on each side of the jaw, slightly flattened, narrow, and pointed; the distal are larger than the proximal, except that the pair at the apex of the jaw are the largest of all. Two or three additional and similar papillae or scales occur on the outer margin of the second oral tentacle-pore, so that there appears to be a series of about ten close-set oral papillae in a single row along each side of the jaw. This species is therefore more like *tropicus* as regards the oral papillae than it is like any other species of the genus. The arm-spines are not at all glassy nor are they skin-covered; they are smooth, slightly tapering but blunt, subequal and a little longer than an arm-joint. On the basal ten or a dozen joints there are three spines on each side, but elsewhere there are only two (hence the name). No other species of Ophioscolex has two spines to a joint, except at the very tip of the arm. The color of this specimen, dried from alcohol, is light yellow-brown.

HOLOTYPE (M. C. Z. 2159). OFF WESTERN CUBA, 190 fms. Blake St. 23.

Mr. Lyman (1878. Bull. M. C. Z., 5, p. 233) refers two specimens, taken at this station, to *O. purpureus* and says he "could see no specific difference on comparing originals from Scandinavia," but in a note left with the only specimen now in the collection he calls attention to the "better marked" oral papillae. He evidently did not notice the highly characteristic number and arrangement of the arm-spines.

36. O. GLACIALIS MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 109.

20 specimens. Franz Josef Land, 125 fms. SPITZBERGEN: Ice Fjord, 134 fms. Norway[1]: Lofoden, 200–300 fms. Sweden: Bohusia; Bohuslän. Off Newport, R. I., 192 fms. Off Charleston, S. C., 75 fms. Off Dominica, 333 fms. Off Barbados, 100–209 fms.

37. O. PURPUREUS DÜBEN and KOREN, 1846. Kongl. Vet.-akad. Handl. f. 1844, p. 235, pl. 6, f. 2a–2c.

9 specimens. Norway[1]: Lofoden, 200–300 fms.; Bodö, 80–100 fms. Between Cape Wrath, Scotland and the Faroe Islands.

38. O. STIMPSONII LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 23, pl. 1, f. 11–15.

HOLOTYPE and 4 PARATYPES. Florida: OFF SOMBRERO KEY, 240 fms.

[1] Without definite locality.

39. O. TROPICUS Lyman, 1878. Bull. M. C. Z., **5**, p. 157, pl. 7, f. 190–192.

9 specimens. Off Martinique, 357–502½ fms. Off Grenada, 461 fms. Off Barbados, 103 fms.

Species of Ophioscolex not represented in the M. C. Z.

40. O. PERTINAX Koehler, 1904. Siboga-exp. Oph. mer prof., p. 145, pl. 25, f. 7, 8. Kei Islands: near Pulu Kor, 225 fms.
41. O. PROLIFER Studer, 1882. Abh. K.-Preus. akad. wiss. Berlin, p. 28, pl. 3, f. 13a–13e. East of New Zealand, 597 fms.
42. O. QUADRISPINUS Verrill, 1885. Rept. U. S. F. C. for 1883, p. 550, pl. 20, f. 56–56a. Off Nova Scotia and in Gulf of Maine, 101–234 fms.
43. O. RETECTUS Koehler, 1895. Rev. biol. Nord France, **7**, p. 462. Bay of Biscay, 784 fms.
44. O. SERRATUS H. L. Clark, 1901. Bull. U. S. F. C., **2**, p. 250, pl. 14, f. 14–17. Porto Rico: off San Juan, 91 fms.

Genera of Ophiomyxidae not represented in the M. C. Z.

Neoplax Bell, 1884. Alert rept., p. 511.

45. Type-species: NEOPLAX OPHIODES Bell, 1884. *op. cit.*, p. 512, pl. 45. Monotypic. Amirante Islands: D'Arros, 22 fms.

Ophiomora Koehler, 1907. Bull. sci., **41**, p. 342.

46. Type-species: OPHIOMORA ELEGANS Koehler, 1907. *loc. cit.*, pl. 14, f. 52, 53. Monotypic. Portugese East Africa: Bahia Fernão Veloso.

Ophiohymen H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 277.

47. Type-species: OPHIOHYMEN GYMNODISCUS H. L. Clark, 1911. *loc. cit.*, f. 140. Monotypic. Eastern Sea, 107–139 fms.

Ophiostyracium H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 253.

48. Type-species: OPHIOSTYRACIUM TRACHYACANTHUM H. L. Clark, 1911. *loc. cit.*, f. 124. Monotypic. Eastern Sea, 440 fms.

Ophioleptoplax H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 278.

49. Type-species: OPHIOLEPTOPLAX MEGAPORA H. L. Clark, 1911. *op. cit.*, p. 279, f. 141. Monotypic when established. Eastern Sea, 71 fms.
50. O. ATLANTICA Koehler, 1914. Bull. 84 U. S. N. M., p. 124, pl. 15, f. 6, 7. Florida: off Cape Canaveral, 509 fms.

OPHIOSTIBA Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 47.

51. Type-species: OPHIOSTIBA HIDEKII MATSUMOTO, 1915. *loc. cit.*, p. 47. Monotypic. Japan: Sagami Sea, 300 fms.

OPHIOHYALUS Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 48.

52. Type-species: OPHIOHYALUS GOTOI MATSUMOTO, 1915. *op. cit.*, p. 49. Monotypic. Japan: Sagami Sea, probably.

OPHIOSMILAX Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 50.

53. Type-species: OPHIOSMILAX MIRABILIS MATSUMOTO, 1915. *loc. cit.*, p. 50. Monotypic. Japan: Sagami Sea, 300 fms.

TRICHASTERIDAE.

ASTEROSCHEMA.

LÜTKEN, 1856. Vid. med., p. 16.

Type-species: *Asterias oligactes* PALLAS, 1788. Nova acta Acad. Caes. Leop., **2**, p. 239. Monotypic when established.

54. A. ARENOSUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 235, pl. 3, f. 62–64.

19 specimens, including HOLOTYPE and 1 COTYPE. GULF OF MEXICO, 804 fms. Florida: off Sand Key, 125 fms. Cuba: OFF HAVANA, 480–805 fms. Off St. Cruz, D. W. I., 580 fms. Off Montserrat, 120 fms. Off Guadeloupe, 196–734 fms. Off St. Vincent, 124–573 fms. Off Barbados, 288 fms.

55. A. BRACHIATUM LYMAN, 1879. Bull. M. C. Z., **6**, p. 67, pl. 17, f. 462–465.

2 specimens. Cuba: off Santiago, 288 fms. Off Grenada, 262 fms.

56. A. FEROX KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 162, pl. 32, f. 4–6, pl. 33, f. 1, 2.

1 COTYPE. NEAR KEI ISLANDS, 114 fms.

57. A. GLAUCUM MATSUMOTO, 1911. Dobuts. Z. Tokyo, **23**, p. 617.

1 COTYPE. Japan: SAGAMI SEA, 110 fms.

58. A. INTECTUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 235, pl. 3, f. 59–61.

HOLOTYPE. Cuba: OFF HAVANA, 175 fms.

59. A. LAEVE (LYMAN).
Asteromorpha laevis LYMAN, 1872. Ann. sci. nat., ser. 5, **16**, p. 3.
Astroschema laeve LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 26, pl. 4, f. 57–59.

17 specimens. Gulf of Mexico: northwest of the Tortugas, 101 fms. Off St. Cruz, D. W. I., 248 fms. Off Montserrat, 88–120 fms. Off Martinique, 96 fms. Off St. Vincent, 95 fms. Off St. Lucia, 116–164 fms. Off Grenada, 268 fms. Off Barbados, 56–103 fms.

60. A. OLIGACTES (PALLAS).
Asterias oligactes PALLAS, 1778. Nova acta Acad. Caes. Leop., **2**, p. 239, pl. 6, f. 23.
Asteroschema oligactes LÜTKEN, 1856. Vid. med., p. 16.

75 specimens. Gulf of Mexico: northwest of the Tortugas, 101 fms. Cuba: off Santiago, 288 fms. Off Montserrat, 88 fms. Off Guadeloupe, 150 fms. Off St. Vincent, 114 fms. Off St. Lucia, 116 fms. Off Carriacou, 163 fms. Off Grenada, 92–262 fms. Off Barbados, 69–125 fms.

61. A. RUBRUM LYMAN, 1879. Bull. M. C. Z., **6**, p. 68, pl. 17, f. 454–457.

1 COTYPE. OFF SOUTHERN CHILE, 400 fms.

62. A. SUBLAEVE LÜTKEN & MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 187, pl. 22, f. 13, 14.

12 specimens, including 11 COTYPES. GULF OF PANAMA, 695 fms. GALAPAGOS ISLANDS: north of Indefatigable Island, 551 fms.

63. A. SULCATUM LJUNGMAN, 1871. Öfv. Kongl. vet-akad. Förh., **28**, p. 637. Plate **1**, f. 10.

1 specimen. West Indies?

64. A. TENUE LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 27. Plate **2**, f. 5.

3 specimens, including the HOLOTYPE. Off Montserrat, 88 fms. Off St. Vincent, 124 fms. OFF BARBADOS, 100 fms.

Species of Asteroschema not represented in the M. C. Z.

65. A. CLAVIGERUM VERRILL, 1894. Proc. U. S. N. M., **17**, p. 295. Off Georges Bank, 956 fms.
66. A. ELONGATUM KOEHLER, 1914. Bull. 84 U. S. N. M., p. 137, pl. 17, f. 1–3. Florida: off Key West, 132 fms.
67. A. FASTOSUM KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 161, pl. 34. Dutch East Indies: Molucca Passage, 647–702 fms.
68. A. FLOSCULUM ALCOCK, 1893. Journ. Asiatic soc. Bengal, **62**, p. 173, pl. 8, f. 5. India: north of Madras, 88 fms.
69. A. HEMIGYMNUM MATSUMOTO, 1912. Dobuts. Z. Tokyo, **24**, p. 381, pl., f. 3, 4. Japan: Sagami Sea.

70. A. HORRIDUM Lyman, 1879. Bull. M. C. Z., **6**, p. 66, pl. 17, f. 458–461. Kermadec Islands, 630 fms.

71. A. INORNATUM Koehler, 1906. Mem. Soc. zool. France, **19**, p. 30, pl. 3, f. 46, 47. 1909. Princesse-Alice Echinod., pl. 7, f. 1 (colored). Bay of Biscay, 823 fms.

72. A. KOEHLERI Döderlein, 1898. Semon's Zool. forsch., **5**, p. 487, pl. 37, f. 5, 5a. Amboina.

73. A. MIGRATOR Koehler, 1904. Siboga-exp. Oph. mer prof., p. 164, pl. 35. Dutch East Indies: Strait of Macassar, 723 fms.

74. A. NUTTINGII Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 77, pl. 7, f. 3, 3a. Florida: off Sand Key and off Key West, 105–125 fms.

75. A. ROUSSEAUI Michelin, 1862. Maillard's Notes sur l'Ile de la Reunion, Annexe A, p. 6. Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 62, f. (as *Asteromorpha steenstrupii*). Reunion.

76. A. SALIX Lyman, 1879. Bull. M. C. Z., **6**, p. 66, pl. 17, f. 466–469. Kermadec Islands, 630 fms.

77. A. TUBIFERUM Matsumoto, 1911. Dobuts. Z. Tokyo, **23**, p. 617. Japan: Sagami Sea.

78 A. TUMIDUM Lyman, 1879. Bull. M. C. Z., **6**, p. 68, pl. 17, f. 450–453. Dutch East Indies: near Kei Islands, 129 fms.

79. A. VICINUM Koehler, 1907. Bull. sci., **41**, p. 345, pl. 14, f. 51–55. Guadeloupe.

Ophiocreas.

Lyman, 1869. Bull. M. C. Z., **1**, p. 347.

Type-species: *Ophiocreas lumbricus* Lyman, 1869. *loc. cit.* Monotypic when established.

80. O. ABYSSICOLUM Lyman, 1879. Bull. M. C. Z., **6**, p. 64, pl. 17, f. 470–473.

2 cotypes. North Pacific Ocean, 2300 fms.

81. O. ADHAERENS Studer, 1884. Abh. K.-Preus. akad. wiss. Berlin, p. 54, pl. 5, f. 11a–d.

1 cotype. Northwestern Australia, 45 fms.

82. O. CARNOSUM Lyman, 1879. Bull. M. C. Z., **6**, p. 63, pl. 16, f. 435–438.

4 cotypes. Southern Chile: off Tom Bay, 175 fms.

83. O. CAUDATUM Lyman, 1879. Bull. M. C. Z., **6**, p. 64, pl. 16, f. 439–442.

1 cotype. Japan: Sagami Sea, off Enoshima, 345 fms.

84. O. GLUTINOSUM Döderlein, 1911. Japan. Euryalae, p. 59, pl. 6, f. 5, 5a.

2 specimens. Japan: Sagami Sea.

85. O. LUMBRICUS Lyman, 1869. Bull. M. C. Z., **1**, p. 347; 1871. Illus. cat. M. C. Z., no. 6, pl. 1, f. 19–21.

25 specimens, including holotype and 3 cotypes. Florida: off Sand Key, 75–128 fms. Off Guadeloupe, 183 fms. Off St. Lucia, 154 fms. Off St. Vincent, 124 fms. Off Grenada, 159 fms. Off Barbados, 288 fms.

86. O. MELAMBAPHES H. L. Clark, 1914. Records West Austr. mus., **1**, p. 155. Plate **1**, f. 9.

1 paratype. West Australia: off Jurien Bay, 80–100 fms.

87. O. OEDIPUS Lyman, 1879. Bull. M. C. Z., **6**, p. 65, pl. 16, f. 443–446. Koehler, 1909. Princesse-Alice Echinod., pl. 7, f. 2 (colored).

4 specimens, including 2 cotypes. Off St. Cruz, D. W. I., 580 fms. Atlantic Ocean: off Ascension Island, 420 fms. Japan: off Omai Saki Light, 475–505 fms.

88. O. PAPILLATUM H. L. Clark, 1908. Bull. M. C. Z., **51**, p. 298. Plate **1**, f. 8.

Holotype. Japan: Hondo; Sea of Idzu.

89. O. RHABDOTUM H. L. Clark, 1914. Records West Austr. mus., **1**, p. 156.

1 paratype. West Australia: off Jurien Bay, 80–100 fms.

90. O. SIBOGAE Koehler, 1904. Siboga-exp. Oph. mer prof., p. 165, pl. 36.

1 cotype. Near Kei Islands, 114 fms.

91. O. SPINULOSUM Lyman, 1883. Bull. M. C. Z., **10**, p. 281, pl. 8, f. 132–135.

96 cotypes. Off Martinique 213 fms. Off St. Lucia, 154 fms. Off St. Vincent, 124–174 fms Off Barbados, 218 fms.

Species of Ophiocreas not represented in the M. C. Z.

92. O. CONSTRICTUM Farquhar, 1900. Trans. N. Z. inst., **32**, p. 405. New Zealand: Dusky Sound; Jackson Bay.
93. O. ENOSHIMANUM Döderlein, 1911. Japan. Euryalae, p. 60, pl. 6, f. 8, 8a, Japan: Sagami Sea. Enoshima.
94. O. JAPONICUM Koehler, 1907. Bull. sci., **41**, p. 346, pl. 14, f. 54. Japan.
95. O. MONACANTHUM Döderlein, 1911. Japan. Euryalae, p. 58, pl. 6, f. 9–9b. Japan: Sagami Sea. Enoshima.
96. O. SAGAMINUM Döderlein, 1911. Japan. Euryalae, p. 60, pl. 6, f. 6, 6a. Japan: Misaki.

Astrocharis.

Koehler, 1904. Siboga-exp. Oph. mer prof., p. 160.

Type-species: *Astrocharis virgo* Koehler, 1904. *loc. cit.* Monotypic when established.

97. A. IJIMAI Matsumoto, 1911. Dobuts. Z. Tokyo, **23**, p. 617.

1 cotype. Japan: Sagami Sea.

Species of Astrocharis not represented in the M. C. Z.

98. A. VIRGO Koehler, 1904. Siboga-exp. Oph. mer prof., p. 160, pl. 20, f. 1; pl. 30, f. 8. Dutch East Indies: between North Borneo and Sulu Archipelago, 290 fms.; Gilolo Strait, 605 fms.

Astroceras.

Lyman, 1879. Bull. M. C. Z., **6**, p. 62.

Type-species: *Astroceras pergamena* Lyman, 1879. *loc. cit.* Monotypic when established.

99. A. PERGAMENA Lyman, 1879. Bull. M. C. Z., **6**, p. 62, pl. 18, f. 478–480.

18 specimens. Japan: off Suno Saki, 52–77 fms.; off Ose Saki, 65–125 fms.; off Omai Saki Light, 36 fms.; southwest of Goto Islands, 95–106 fms.

Species of Astroceras not represented in the M. C. Z.

100. A. COMPAR Koehler, 1904. Siboga-exp. Oph. mer prof., p. 158, pl. 22, f. 5. Kei Islands: near the Three Brothers, 113–167 fms.

Astrogymnotes.

H. L. Clark, 1914. Records West Austr. mus., **1**, p. 153.

Type-species: *Astrogymnotes catasticta* H. L. Clark, 1914. *op. cit.*, p. 154. Monotypic.

101. A. CATASTICTA H. L. Clark, 1914. Records West Austr. mus., **1**, p. 154, pl. 22.

5 PARATYPES. West Australia: OFF JURIEN BAY, 80–100 fms.

Trichaster.

L. Agassiz, 1835. Mem. Soc. sci. nat. Neuchatel, **1**, p. 193.

Type-species: *Euryale palmiferum* Lamarck, 1816. Anim. sans Vert., **2**, p. 539. Monotypic when established.

102. T. ELEGANS Ludwig, 1878. Zeits. f. wiss. zool., **31**, p. 59, pl. 5.

1 specimen. Locality?

103. T. PALMIFERUS (Lamarck).
Euryale palmiferum Lamarck, 1816. Anim. sans Vert., **2**, p. 539. Encyc. method. pl. 126.
Tricaster palmiferus L. Agassiz, 1835. Mem. Soc. sci. nat. Neuchatel, **1**, p. 193.

2 specimens. Indian Ocean. Japan: Colnett Strait, 84 fms.

Euryale.

Lamarck, 1816. Anim. sans Vert., **2**, p. 535.

Type-species: *Euryale asperum* Lamarck, 1816. *op. cit.*, p. 538. Type selected (virtually) by Lyman, 1879. Bull. M. C. Z., **6**, p. 60.

104. E. ASPERA Lamarck, 1816. Anim. sans Vert., **2**, p. 538. Döderlein, 1911. Japan. Euryalae, p. 65, pl. 5, f. 7, 7a.

6 specimens. Singapore. Philippine Islands, 0–10 fms.

Species of Euryale not represented in the M. C. Z.

105. E. ANOPLA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 294, f. 144. Eastern Sea, 103–152 fms.

Asteronyx.

Müller and Troschel, 1842. Syst. Ast., p. 85, 119.

Type-species: *Asteronyx loveni* Müller and Troschel, 1842. *op. cit.*, p. 119. Monotypic when established.

106. A. DISPAR Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 185, pl. 21, f. 1, 2.

9 specimens, including 4 cotypes. Lower California: off Point San Tomas, 868–1076 fms.; off Rosario Bay, 879 fms. Mexico: off Mazatlan, 995 fms. Gulf of Panama, 1020–1270 fms.

107. A. EXCAVATA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 185, pl. 22, f. 2–6.

2 specimens, including 1 cotype. Lower California: off Cape St. Lucas, 491 fms. Mexico: near Las Tres Marias Islands, 676 fms.

108. A. LOVENI Müller and Troschel, 1842. Syst. Ast., p. 119, pl. 10, f. 3–5.

73 specimens. Norway: Finmark, 100 fms. Scotland: The Minch. East of Nantucket, 980 fms. Off St. Vincent, 573 fms. Lower California: southwest of San Cristobal Bay, 284 fms. Off California, 627 fms. Off Washington, 859 fms. Off British Columbia, 876 fms. Off Alaskan Peninsula, 625 fms. Off eastern Japan, 129 fms. Off southeastern Japan, 345 fms.

109. A. PLANA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 186, pl. 21, f. 3, 4.

1 cotype. Gulf of Panama: southwest of Malpelo Island, 1132 fms.

Genera of Trichasteridae not represented in the M. C. Z.

Ophiuropsis Studer, 1884. Abh. K.-Preus. acad. wiss. Berlin, p. 55.

110. Type-species: OPHIUROPSIS LYMANI Studer, 1884. *op. cit.*, pl. 5, f. 12a–d. Monotypic. Off German Southwest Africa, 60 fms.

Sthenocephalus Koehler, 1898. Bull. sci., **31**, p. 111.

111. Type-species: STHENOCEPHALUS INDICUS Koehler, 1898. *op. cit.*, p. 112, pl. 5, f. 48–49. Monotypic. Dutch East Indies: Gaspar Strait, 30 fms.

ASTRODIA Verrill, 1899. Bull. Univ. Iowa, new ser. **1**, no. 6, p. 74.

112. Type-species: ASTRONYX TENUISPINA VERRILL, 1884. Amer. journ. sci., ser. 3, **28**, p. 219. KOEHLER, 1907. Travailleur et Talisman Oph., p. 304, pl. 21, f. 48–50. Monotypic. Off east coast of the United States, 1362–2033 fms.

GORGONOCEPHALIDAE.

ASTROTOMA.

LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 24.

Type-species: *Astrotoma agassizii* LYMAN, 1875. *loc. cit.* Monotypic when established.

113. A. AGASSIZII LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 24, pl. 14, f. 52–56.

4 specimens, including HOLOTYPE. PACIFIC SIDE, STRAIT OF MAGELLAN, 135 fms. Chile: southern coast, 175 fms.

Species of Astrotoma not represented in the M. C. Z.

114. A. MURRAYI LYMAN, 1879. Bull. M. C. Z., **6**, p. 61, pl. 18, f. 474–476. Dutch East Indies: near Banda Islands, 200 fms.

115. A. SOBRINA MATSUMOTO, 1912. Dobuts. Z. Tokyo, **24**, p. 199. DÖDERLEIN, 1911. Japan. Euryalae, pl. 6, f. 1, 1a (as *A. murrayi*). Japan: Sagami Sea.

116. A. WAITEI BENHAM, 1909. Records Canterbury mus., **1**, no. 2, p. 19, pl. 9. New Zealand: east coast of Otago.

ASTROCHELE.

VERRILL, 1878. Amer. journ. sci., ser. 3, **16**, p. 374.

Type-species: *Astrochele lymani* VERRILL, 1878. *loc. cit.* Monotypic when established.

117. A. LAEVIS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 281, f. 143.

6 PARATYPES. BERING SEA, 59–283 fms. ALEUTIAN ISLANDS: OFF AGATTU, 482 fms.

118. A. LYMANI VERRILL, 1878. Amer. journ. sci., ser. 3, **16**, p. 374. Plate **2**, f. 6.

9 specimens. Off Nantucket, 304–980 fms.

ASTROGOMPHUS.

LYMAN, 1869. Bull. M. C. Z., **1**, p. 350.

Type-species: *Astrogomphus vallatus* LYMAN, 1869. *loc. cit.* Monotypic when established.

119. A. VALLATUS LYMAN, 1869. Bull. M. C. Z., **1**, p. 350. 1871. Illus. cat. M. C. Z., no. 6, pl. 1, f. 16–18.

45 specimens, including HOLOTYPE and 13 PARATYPES. Off Georgia, 337 fms.

Florida: off American Shoal, 94–98 fms.; off Conch Reef, 117 fms.; off Bahia Honda, 119 fms.; off Sand and Sombrero Keys, 128–270 fms.; southwest of Key West, 137 fms. Cuba: off Bahia de Cadiz, 120 fms. Off Martinique, 189 fms. Off St. Vincent, 88–124 fms.

Species of Astrogomphus not represented in the M. C. Z.

120. A. MUNITUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 157, pl. 22, f. 6, pl. 32, f. 1. Dutch East Indies: Molucca Passage, 605 fms.

121. A. RUDIS Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 82, pl. 7, f. 1, 1a. Florida: Pourtalès Plateau and off Sand Key, 116–200 fms.

ASTEROPORPA.

Lütken, 1856. Vid. med., p. 17.

Type-species: *Asteroporpa annulata* Lütken, 1856. *loc. cit.* Monotypic when established.

122. A. ANNULATA Lütken, 1856. Vid. med., p. 17. 1859. Add. ad hist. Oph., pt. 2, pl. 5, f. 4a–d.

33 specimens. Off St. Cruz, D. W. I., 115 fms. Off Montserrat, 88 fms. Guadeloupe. Off Dominica, 130 fms. Off Martinique, 96 fms. Off Carriacou, 163 fms. Off Grenada, 92 fms. Off Barbados, 56–123 fms.

123. A. HADRACANTHA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 280, f. 142.

2 paratypes. Japan: off eastern coast, 34 fms.; off Omai Saki Light, 34–37 fms.

124. A. PULCHRA, sp. nov. (*pulcher*, beautiful). Plate **2**, f. 7.

Disk, 8 mm. in diameter; arms about 50 mm. long. Similar to *annulata* but differing in two striking particulars. On the arms, the annulations of hooklets appear to alternate with annula of smooth tubercles. Comparison with *annulata* shows that the series of large, smooth plates, in the middle of the paved valleys between the annulations of hooklets in that species, has, in *pulchra* become greatly enlarged and conspicuously elevated. At the same time it has become light colored in marked contrast to the smooth plates on either side. Consequently there are really annulations of smooth tubercles alternating with the annulations of hooklets. Distally these annulations of tubercles become less and less evident and near the tip of the arm they are indicated only by a light-colored line. On the disk, there are no lines of tubercles or hooklets, across the radial shields, except at the distal ends. Instead, each

radial shield bears a close-set, median, longitudinal series of 7–9 rounded, white tubercles, somewhat larger than the largest smooth tubercles on the arm. On each side of each radial shield is an irregular series of 4–5 smaller, white tubercles. Between the proximal ends of each pair of radial shields, is a single large, white tubercle. In color (specimens dried from alcohol), all the upper surface of disk and arms, except the annulations of hooklets and tubercles, and the tubercles of the disk, which are white, is brown; the lower surface is yellowish white.

HOLOTYPE (M. C. Z. 2808) and 2 PARATYPES, (M. C. Z. 2809, 2810). OFF BARBADOS, 56–125 fms.

These specimens were collected by the BLAKE and were identified by Mr. Lyman as doubtfully *annulata*. On the back of one label he has written: "Does Astrocnida sometimes not fork?" The smallest specimen is 4 mm. across the disk and is similar to the larger ones, but the tubercles on the disk at the inner end of the radial shields are larger and relatively much more conspicuous. Study of a series of *annulata* shows that the two individuals upon which Lütken somewhat doubtfully based a second species of Asteroporpa (named *affinis*) were merely variants and that intermediate forms between them and typical *annulata* are not rare. But no individuals have been seen which are in any way intermediate between *annulata* and *pulchra*.

Species of Asteroporpa not represented in the M. C. Z.

125. A. AUSTRALIENSIS H. L. CLARK, 1909. Mem. Austr. mus., **4**, p. 547, pl. 54, f. 2. New South Wales: off Wollongong, 55–56 fms.

ASTROCNIDA.

LYMAN, 1872. Ann. sci. nat., ser. 5, **16**, no. 4, p. 1.

Type-species: *Trichaster isidis* DUCHASSAING, 1850. Anim. Rad. Antilles, p. 6. Monotypic.

126. A. ISIDIS (DUCHASSAING).
Trichaster isidis DUCHASSAING, 1850. Anim. Rad. Antilles, p. 6.
Astrocnida isidis LYMAN, 1872. Ann. sci. nat., ser. 5, **16**, no. 4, p. 1. A. AGASSIZ, 1888. Bull. M. C. Z., **15**, p. 115, f. 400.

4 specimens. Off Montserrat, 88 fms. Off Barbados, 56–100 fms.

Conocladus.

H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 132.

Type-species: *Conocladus oxyconus* H. L. Clark, 1909. *loc. cit.* Monotypic when established.

127. C. AMBLYCONUS H. L. Clark, 1909. Mem. Austr. mus., **4**, p. 549, pl. 55.

5 PARATYPES. New South Wales [1]: OFF COOGEE, 49–50 fms.

128. C. MICROCONUS H. L. Clark, 1914. Records West Austr. mus., **1**, p. 156, pl. 25, upper f.

1 PARATYPE. West Australia: BETWEEN FREMANTLE AND GERALDTON, 80–120 fms.

129. C. OXYCONUS H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 132, plate, f. 1–3.

3 specimens; HOLOTYPE and PARATYPES. New South Wales: OFF PORT JACKSON, 40–50 fms.

Astroconus.

Döderlein, 1911. Japan. Euryalae, p. 36.

Type-species: *Astrophyton australe* Verrill, 1876. Bull. 3 U. S. N. M., p. 74. Monotypic.

130. A. AUSTRALIS (Verrill).

Astrophyton australe Verrill, 1876. Bull. 3 U. S. N. M., p. 74.
Astroconus australis Döderlein, 1911. Japan. Euryalae, p. 36, pl. 5, f. 2, 2a.

1 COTYPE. TASMANIA.

Gorgonocephalus.

Leach, 1815. Zool. misc., **2**, p. 51.

Type-species: *Asterias caput-medusae* Linné, 1758. Syst. nat., ed. 10, p. 653. 1761. Fauna Suecica, p. 513. Type virtually selected by Leach.

131. G. ARCTICUS Leach, 1819. Ross's Voy. of disc., **2**, app. 4, p. 178. Döderlein, 1900. Echinod. Olga-exp., pl. 10, f. 5, 6 (as *G. agassizii*). Koehler, 1909. Princesse-Alice Echinod., pl. 9 (as *G. agassizii*, colored).

104 specimens. Spitzbergen: Ice Fjord, 134 fms. Gulf of St. Lawrence. Quebec: near Gaspé. Maine: Eastport; Frenchman's Bay. Massachusetts: Swampscott; Cape Cod; Provincetown, off Race Point.

132. G. CAPUTMEDUSAE (Linné).

Asterias caput-medusae Linné, 1758. Syst. nat., ed. 10, p. 663. 1761. Fauna Suecica, p. 513.
Gorgonocephalus caput-medusae Döderlein, 1911. Japan. Euryalae, p. 6. 1900. Echinod. Olga-exp., pl. 9, f. 6 (as *G. lincki*).

3 specimens. North Europe. Norway: Bergen.

[1] Without definite locality.

133. G. CHILENSIS (PHILIPPI).

Astrophyton chilense PHILIPPI, 1858. Arch. naturg., **24**, p. 268.
Gorgonocephalus chilensis LYMAN, 1882. Challenger Oph., p. 261. 1875. Illus. cat. M. C. Z., no. 8, pt. 2, pl. 4, f. 41–43 (as *A. pourtalesii*).

8 specimens, including 1 COTYPE, and holotype of *Astrophyton pourtalesii* Lyman. CHILE: MESSIER CHANNEL. Patagonia: off northeastern coast; off Cape Three Points, 60 fms.; off Cape Dos Bayos, 55 fms.; east of Magellan Strait, 55 fms. Kerguelen Island: Christmas Harbor, 120 fms.

134. G. EUCNEMIS (MÜLLER and TROSCHEL).

Astrophyton eucnemis MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 123.
Gorgonocephalus eucnemis DÖDERLEIN, 1900. Echinod. Olga-exp., p. 226, pl. 10, f. 1–4.

43 specimens, including holotype of *Astrophyton caryi* Lyman. Greenland. Karahavet. East of Shetland, 64 fms. Bering Sea, 31–60 fms. Off Copper Island, 54–57 fms. St. Pauls Island. Off Alaskan Peninsula, 41–54 fms. Saghalin: Aniwa Bay, 42–43 fms. Sea of Japan, 428 fms. Japan: southwest of Goto Islands, 181 fms. Puget Sound: Friday Harbor. California: San Francisco Bay.

135. G. LAMARCKII (MÜLLER and TROSCHEL).

Astrophyton lamarckii MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 123.
Gorgonocephalus lamarckii LYMAN, 1882. Challenger Oph., p. 263. DÖDERLEIN, 1900. Echinod. Olga-exp., pl. 9, fig. 7.

13 specimens. Norway: Finmark. North Europe. East of Sable Island, 160–300 fms. Off Nova Scotia, 300 fms. Banquereau (off New England), 200–300 fms. Off New England, 110–120 fms.

Species of Gorgonocephalus not represented in the M. C. Z.

136. G. DIOMEDEAE LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 188, pl. 21, f. 5, pl. 22, f. 1. Panama: off Mariato Point, 695 fms.

137. G. DOLICHODACTYLUS DÖDERLEIN, 1911. Japan. Euryalae, p. 34, pl. 1, f. 4, 5. Japan: Sagami Sea, 83–84 fms.

138. G. TUBEROSUS DÖDERLEIN, 1902. Zool. anz., **25**, p. 322. 1911. Japan. Euryalae, pl. 2, f. 1–2. Japan: Sagami Sea, 134 fms.

ASTRODENDRUM.

DÖDERLEIN, 1911. Japan. Euryalae, p. 28, 38.

Type-species: *Gorgonocephalus sagaminus* DÖDERLEIN, 1902. Zool. anz., **25**, p. 321. Type designated.

139. A. SAGAMINUM (DÖDERLEIN).

Gorgonocephalus sagaminus DÖDERLEIN, 1902. Zool. anz., **25**, p. 321.
Astrodendrum sagaminum DÖDERLEIN, 1911. Japan. Euryalae, p. 28, pl. 2, f. 3–5.

4 specimens. Off EASTERN JAPAN, 63–75 fms.

Species of Astrodendrum not represented in the M. C. Z.

140. A. LAEVIGATUM (Koehler), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 365, pl. 9, f. 78, 79. (*Gorgonocephalus*). Ceylon: off Colombo, 142–400 fms.

Astrospartus.

Döderlein, 1911. Japan. Euryalae, p. 28, 50.

Type-species: *Euryalae mediterraneus* Risso, 1826. Hist. nat. Europ. mer., **5**, p. 274. Type designated.

141. A. MEDITERRANEUS (Risso).
Euryale mediterraneus Risso, 1826. Hist. nat. Europ. mer., **5**, p. 274. L. Agassiz, 1839. Mém. Soc. sci. nat. Neuchatel, **2**, no. 8, pl. 4, 5 (as *Gorgonocephalus arborescens*).
Astrospartus mediterraneus Döderlein, 1911. Japan. Euryalae, p. 28.

5 specimens. Mediterranean Sea. Nice. Naples.

142. A. MUCRONATUS (Lyman).
Astrophyton mucronatum Lyman, 1869. Bull. M. C. Z., **1**, p. 348.
Astrospartus mucronatus Döderlein, 1911. Japan. Euryalae, p. 28, pl. 9, f. 1, 1a.

6 specimens, including holotype and 1 paratype. Florida[1]: off Sand Key, 120–125 fms.; off Sombrero Key. Cuba: off Santiago, 288 fms. Off St. Vincent, 124 fms.

Astrocladus.

Verrill, 1899. Trans. Conn. acad., **10**, p. 369.

Type-species: *Euryale verrucosum* Lamarck, 1816 = *Asterias euryale* Retzius, 1783. K. Vet. akad. Handl., **4**, p. 243. Type designated.

143. A. CONIFERUS (Döderlein).
Astrophyton coniferum Döderlein, 1902. Zool. anz., **25**, p. 325.
Astrocladus coniferus Döderlein, 1911. Japan. Euryalae, p. 46, pl. 3, f. 1–3a.

3 specimens. Japan: in Korea Strait, 59 fms.; off Omai Saki Light, 36 fms.

144. A. EURYALE (Retzius).
Asterias euryale Retzius, 1783. K. Vet. akad. Handl., **4**, p. 243.
Astrocladus euryale Döderlein, 1911. Japan. Euryalae, p. 28. L. Agassiz, 1839. Mém. Soc. sci. nat. Neuchatel, **2**, no. 8, pl. 1–3 (as *Gorgonocephalus verrucosus*).

4 specimens. Cape of Good Hope.[1] Cape Colony: Simon's Bay, 10–20 fms.

[1] Without definite locality.

145. A. EXIGUUS (LAMARCK).
Euryale exiguum LAMARCK, 1816. Anim. sans Vert., **2**, p. 539.
Astrocladus exiguus DÖDERLEIN, 1911. Japan. Euryalae, p. 41, pl. 9, f. 6.

4 specimens. Japan: in Colnett Strait, 83–84 fms. Philippine Islands: near Zamboangan, 10–20 fms.

Species of Astrocladus not represented in the M. C. Z.

146. A. ANNULATUS (MATSUMOTO), 1912. Dobuts. Z. Tokyo, **24**, p. 206, f. 17, 18 (*Astrophyton*). Japan: Sagami Sea.
147. A. LUDWIGI (DÖDERLEIN), 1896. Jena. denkschr., **8**, p. 299, pl. 17, f. 28–28c (*Euryale*). Amboina.
148. A. TONGANUS DÖDERLEIN, 1911. Japan. Euryalae, p. 77, pl. 9, f. 8. Tonga Islands.

ASTROBOA.

DÖDERLEIN, 1911. Japan. Euryalae, p. 28, 50.

Type-species: *Astrophyton clavatum* LYMAN, 1861. Proc. Boston soc. nat. hist., **8**, p. 85.

149. A. CLAVATA (LYMAN).
Astrophyton clavatum LYMAN, 1861. Proc. Boston soc. nat. hist., **8**, p. 85.
Astroboa clavata DÖDERLEIN, 1911. Japan. Euryalae, p. 28, pl. 5, f. 6, 6a.

3 specimens, including HOLOTYPE. Mauritius. ZANZIBAR.

150. A. ERNAE DÖDERLEIN, 1911. Japan. Euryalae, p. 82, pl. 9, f. 7, 7a.

1 specimen. West Australia: off Geraldton, 29 fms.

151. A. NUDA (LYMAN).
Astrophyton nudum LYMAN, 1874. Bull. M. C. Z., **3**, p. 251, pl. 6, f. 4, 5.
Astroboa nuda DÖDERLEIN, 1911. Japan. Euryalae, p. 86.

HOLOTYPE. PHILIPPINE ISLANDS, 17 fms.

Species of Astroboa not represented in the M. C. Z.

152. A. ARCTOS MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 57. Japan: Misaki, 5–10 fms.; Sagami Sea.
153. A. ELEGANS (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 123, pl. 18, f. 1 (*Astrophyton*). Dutch East Indies: Solor Strait, 63 fms.
154. A. GLOBIFERA (DÖDERLEIN), 1902. Zool. anz., **25**, p. 324 (*Astrophyton*); 1911. Japan. Euryalae, pl. 2, f. 8–9. Japan: Sagami Sea.
155. A. NIGRA DÖDERLEIN, 1911. Japan. Euryalae, p. 83, pl. 9, f. 9, 9a. Zanzibar.

Astrophyton.

Müller and Troschel, 1842. Syst. Ast., p. 85, 121.

Type-species: *Euryale muricatum* Lamarck, 1816. Anim. sans Vert., **2**, p. 538. Type determined by elimination; genus now monotypic.

156. A. MURICATUM (Lamarck).

Euryale muricatum Lamarck, 1816. Anim. sans Vert., **2**, p. 538.
Astrophyton muricatum Müller and Troschel, 1842. Syst. Ast., p. 122. Döderlein, 1911. Japan. Euryalae, pl. 5, f. 1.

28 specimens. South Carolina: Charleston. Florida[1]: Elliott's Key; Key West; Tortugas; Charlotte Harbor, Captiva Pass. Bahamas: Nassau. Jamaica: Montego Bay. Off St. Lucia, 278 fms.

Astrogordius.

Döderlein, 1911. Japan. Euryalae, p. 29, 54.

Type-species: *Astrophyton cacaoticum* Lyman, 1874. Bull. M. C. Z., **3**, p. 250. Monotypic.

157. A. CACAOTICUS (Lyman).

Astrophyton cacaoticum Lyman, 1874. Bull. M. C. Z., **3**, p. 250, pl. 6, f. 1–3.
Astrogordius cacaoticus Döderlein, 1911. Japan. Euryalae, p. 29.

1 cotype. Guadeloupe, 20 fms.

Astrocyclus.

Döderlein, 1911. Japan. Euryalae, p. 29, 55.

Type-species: *Asterophyton caecilia* Lütken, 1856. Vid. med., p. 18. Monotypic.

158. A. CAECILIA (Lütken).

Asterophyton caecilia Lütken, 1856. Vid. med., p. 18.
Astrocyclus caecilia Döderlein, 1911. Japan. Euryalae, p. 29, pl. 8, f. 2, 2a.

8 specimens. West Indies: off St. Vincent, 124 fms.; off Barbados, 84–125 fms.

Astrocaneum.

Döderlein, 1911. Japan. Euryalae, p. 91.

Type-species: *Astrophyton spinosum* Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 29. Type designated.

159. A. PANAMENSE (Verrill).

Astrophyton panamense Verrill, 1867! Trans. Conn. acad., **1**, p. 251.
Astrocaneum panamense Döderlein, 1911. Japan. Euryalae, p. 91, pl. 8, f. 3.

2 specimens, including 1 cotype. Panama: Pearl Islands.

[1] Without definite locality.

160. A. SPINOSUM (LYMAN).

Astrophyton spinosum LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 29, pl. 4, f. 44–47.
Astrocaneum spinosum DÖDERLEIN, 1911. Japan. Euryalae, p. 91, pl. 8, f. 4, 5.

HOLOTYPE. PANAMA.

Genera of Gorgonocephalidae not represented in the M. C. Z.

ASTROTHROMBUS H. L. Clark, 1909. Mem. Austr. mus., **4**, p. 548.

161. Type-species: ASTROTHROMBUS RUGOSUS H. L. CLARK, 1909. *loc. cit.*, pl. 54, f. 3. Monotypic. New South Wales: off Wollongong, 55–56 fms.

ASTROTHORAX Doderlein, 1911. Japan. Euryalae, p. 24.

162. Type species: ASTROTHORAX MISAKIENSIS DÖDERLEIN, 1911. *loc. cit.*, pl. 6, f. 2–2b. Monotypic. Japan: Misaki.

ASTROTHAMNUS Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 55.

163. Type-species: ASTROTOMA ECHINACEA MATSUMOTO, 1912. Dobuts. Z. Tokyo, **24**, p. 200, f. 6–8. Type designated. Japan: Sagami Sea.

164. A. BELLATOR (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 154, pl. 19, f. 8 (*Astrotoma*). Off Sulu Archipelago, 150–151 fms.

165. A. RIGENS (KOEHLER), 1910. Rec. Indian mus., **5**, p. 86, pl. 5, f. 5–8 (*Astrotoma*). Arabian Peninsula: off Oman, 492 fms.

166. A. VECORS (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 155, pl. 21, f. 9 (*Astrotoma*). Dutch East Indies: off Kei Islands, 114 fms.; off Rotti, 289 fms.

ASTROCLON Lyman, 1879. Bull. M. C. Z., **6**, p. 69.

167. Type-species: ASTROCLON PROPUGNATORIS LYMAN, 1879. *loc. cit.*, pl. 18, f. 481–486. Monotypic when established. Dutch East Indies: off Kei Islands, 129 fms.

168. A. SUENSONI MORTENSEN, 1911. Vid. med., **63**, p. 209. Japan: off Fukaye Shima, 110 fms.

ASTROCHLAMYS Koehler, 1912. Charcot-exp. Ech., p. 142.

169. Type-species: ASTROCHLAMYS BRUNEUS KOEHLER, 1912. *op. cit.*, p. 143, pl. 11, f. 3, 4, 6, 7, 14, 15. Monotypic. West Antarctica: Marguerite Bay, 110–112 fms.

ASTROCHALCIS Koehler, 1905. Siboga-exp. Oph. litt., p. 129.

170. Type-species: ASTROCHALCIS TUBERCULOSUS KOEHLER, 1905. *op. cit.*, p. 130, pl. 16, f. 1, 2. Monotypic when established. Dutch East Indies: off Misol, 19 fms.; near Aru Islands, 7–32 fms.; off Sumbawa, 41 fms.

171. A. MICROPUS MORTENSEN, 1912. Vid. med., **63**, p. 257. Philippine Islands: San Bernardino Strait, 50–100 fms.

ASTRODACTYLUS Döderlein, 1911. Japan. Euryalae, p. 29, 56.

172. Type-species: ASTROPHYTON SCULPTUM DÖDERLEIN, 1896. Jena. denkschr., **8**, p. 299, pl. 18, f. 29. Type designated. Amboina.

173. A. GRACILIS (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 125, pl. 17, f. 1, 2 (*Astrophyton*). Dutch East Indies: off Sumbawa, 41 fms.

174. A. ROBILLARDI (DE LORIOL), 1899. Mem. Soc. phys. hist. nat. Genève, **33**, pt. 2, no. 1, p. 31, pl. 3, f. 3 (*Gorgonocephalus*). Mauritius.

LAEMOPHIURIDA.

HEMIEURYALIDAE.

OPHIOMOERIS.

KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 16.

Type-species: *Ophiomoeris spinosa* KOEHLER, 1904. *op. cit.*, p. 17. Type here designated for first time.

175. O. CLAUSA (LYMAN).
Ophioceramis (?) *clausa* LYMAN, 1878. Bull. M. C. Z., **5**, p. 124, pl. 6, f. 161–163.
Ophiomoeris clausa KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 17.

1 specimen. Off Kermadec Islands, 600 fms.

176. O. SPINOSA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 17, pl. 4, f. 1–3.

3 COTYPES. OFF KEI ISLANDS, 167 fms.

Species of Ophiomoeris not represented in the M. C. Z.

177. O. PROJECTA MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 65. Japan: Uraga Channel, off Ukishima, 300 fms.; Osumi, off Ujishima.

178. O. TENERA (KOEHLER), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 317, pl. 6, f. 30, 31. (*Ophioceramis*). Laccadive and Andaman Islands, 265–636 fms.

OPHIURASES.

H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 250.

Type-species: *Ophioceramis* (?) *obstricta* LYMAN, 1878. Bull. M. C. Z., **5**, p. 124. Monotypic.

179. O. OBSTRICTUS (LYMAN).
Ophioceramis (?) *obstricta* LYMAN, 1878. Bull. M. C. Z., **5**, p. 124.
Ophiurases obstrictus H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 250, f. 122.

3 specimens, including 1 COTYPE. Japan: southwest of Goto Islands, 95 fms. NEAR ARU ISLANDS, 129 fms.

Ophiochondrus.

Lyman, 1869. Bull. M. C. Z., **1**, p. 327.

Type-species: *Ophiochondrus convolutus* Lyman, 1869. *op. cit.*, p. 328. Monotypic when established.

180. O. CONVOLUTUS Lyman, 1869. Bull. M. C. Z., **1**, p. 328. 1871. Illus. cat. M. C. Z., no. 6, pl. 2, f. 7.

14 specimens, including HOLOTYPE. Cuba: OFF CHORRERA, 270 fms.; near Morro Light; off Havana, 175–400 fms. Off Martinique, 213 fms. Off St. Vincent, 124 fms. Off Cannouan, 127 fms. Off Grenada, 92–164 fms. Off Barbados, 221 fms.

181. O. CRASSISPINUS Lyman, 1883. Bull. M. C. Z., **10**, p. 275, pl. 7, f. 111–113.

4 specimens, including HOLOTYPE. OFF GEORGIA, 229 fms. Off St. Vincent, 114–174 fms.

182. O. STELLIGER Lyman, 1879. Bull. M. C. Z., **6**, p. 44, pl. 13, f. 371–373.

1 COTYPE. OFF RIO DE LA PLATA, 600 fms.

Species of Ophiochondrus not represented in the M. C. Z.

183. O. ARMATUS (Koehler), 1907. Bull. 99 Inst. ocean., p. 46 (*Ophioplus*); 1914. Bull. 84 U. S. N. M., pl. 14, f. 2, 3, 6. Near the Azores, 700 fms.

184. O. GRACILIS Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 64. Cuba: off Havana, 110–260 fms.

185. O. GRANULATUS Koehler, 1914. Bull. 84 U. S. N. M., p. 127, pl. 14, f. 1, 4, 5. Loc.?

Ophiochondrella.

Verrill, 1899. Trans. Conn. Acad., **10**, p. 355.

Type species: *Ophiochondrus squamosus* Lyman, 1883. Bull. M. C. Z., **10**, p. 275. Monotypic.

186. O. SQUAMOSA (Lyman).
Ophiochondrus squamosus Lyman, 1883. Bull. M. C. Z., **10**, p. 275, pl. 7, f. 108–110.
Ophiochondrella squamosus Verrill, 1899. Trans. Conn. Acad., **10**, p. 356.

HOLOTYPE. OFF ST. KITTS, 250 fms.

Sigsbeia.

Lyman, 1878. Bull. M. C. Z., **5**, p. 233.

Type-species: *Sigsbeia murrhina* Lyman, 1878. *op. cit.*, p. 234. Monotypic.

187. S. LINEATA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 183, pl. 20, f. 5–8.

3 COTYPES. GALAPAGOS: OFF CHATHAM ISLAND, 53 fms.

188. S. MURRHINA LYMAN, 1878. Bull. M. C. Z., **5**, p. 234, pl. 3, f. 55–58.

243 specimens, including HOLOTYPE and 3 PARATYPES. Cuba: OFF HAVANA, 175 fms. Off St. Cruz, D. W. I., 115 fms. Off Montserrat, 88–120 fms. Off Guadeloupe, 150 fms. Off Martinique, 96–191 fms. Off St. Lucia, 116–422 fms. Off St. Vincent, 88–174 fms. Off Carriacou, 163 fms. Off Cannouan, 127 fms. Off Grenada, 170–262 fms. Off Barbados, 106 fms.

OPHIOHOLCUS,[1] gen. nov.

Type-species: *Sigsbeia sexradiata* KOEHLER, 1914. Bull. 84 U. S. N. M., p. 135.

This genus is well distinguished by the furrow on the lower surface of the arms which accompanies the absence of all but the first two or three under armplates. In other respects, it is very near Ophiochondrella.

189. O. SEXRADIATUS (KOEHLER).
Sigsbeia sexradiata KOEHLER, 1914. Bull. 84 U. S. N. M., p. 135, pl. 17, f. 4, 5.

3 specimens. Off Martinique, 334–357 fms.

OPHIOPLUS.

VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 70.

Type-species: *Hemieuryale tuberculosa* LYMAN, 1883. Bull. M. C. Z., **10**, p. 276. Monotypic.

190. O. TUBERCULOSUS (LYMAN).
Hemieuryale tuberculosa LYMAN, 1883. Bull. M. C. Z., **10**, p. 276, pl. 8, f. 123–127.
Ophioplus tuberculosus VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 70.

7 specimens; HOLOTYPE and 6 PARATYPES. OFF ST. CRUZ, D. W. I., 115 fms. OFF MARTINIQUE, 96 fms.

HEMIEURYALE.

VON MARTENS, 1867. Monatsb. K.-Preus. akad. wiss. Berlin (Juli), p. 484.

Type-species: *Hemieuryale pustulata* VON MARTENS, 1867. *loc. cit.* Monotypic.

191. H. PUSTULATA VON MARTENS, 1867. Monatsb. K.-Preus. akad. wiss. Berlin (Juli), p. 484, pl., f. 2–2b.

33 specimens. WEST INDIES: off St. Cruz, D. W. I., 115 fms.; off Martinique, 96 fms.; off Barbados, 84–125 fms.

[1] ὄφις, snake + ὁλκός, furrow.

Genera of Hemieuryalidae not represented in the M. C. Z.

OPHIOGYPTIS Koehler, 1905. Siboga-exp. Oph. litt., p. 121. Monotypic.

192. Type-species: OPHIOGYPTIS NODOSA KOEHLER, 1905. *loc. cit.*, pl. 12, f. 11–14. Dutch East Indies: off Kei Islands, 50 fms.; Solor Strait, 63 fms.; off Sumbawa, 41 fms.

OPHIOSCHIZA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 254. Monotypic.

193. Type-species: OPHIOSCHIZA MONACANTHA H. L. CLARK, 1911. *op. cit.*, p. 255, f. 125. Bering Sea, 283 fms.

OPHIACANTHIDAE.

OPHIOLEBES.

LYMAN, 1878. Bull. M. C. Z., **5**, p. 158.

Type-species: *Ophiolebes scorteus* LYMAN, 1878. *loc. cit.* Type here first definitely designated.

194. O. ASAPHES H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 239, f. 114.

4 PARATYPES. Japan: HOKKAIDO, SOUTH COAST, 175–349 fms.; HONDO, EASTERN COAST, 182 fms.

195. O. BRACHYGNATHUS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 240, f. 115.

1 PARATYPE. OFF KURILE ISLANDS, 229 fms.

196. O. BREVISPINUS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 247, f. 120.

6 PARATYPES. BERING SEA, 283 fms.

197. O. CLAVIGER (LJUNGMAN).

Ophiactis clavigera LJUNGMAN, 1864. Öfv. Kongl. vet.-akad. Förh., **21**, p. 365, pl. 15, f. 4.
Ophiolebes claviger LYMAN, 1878. Bull. M. C. Z., **5**, p. 158.

8 specimens. North Sea. Off Cape Cod, 524 fms. Off South Carolina, 229 fms.

198. O. DIAPHORUS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 245, f. 118.

4 PARATYPES. BERING SEA, 55 fms. ALEUTIAN ISLANDS: ATTU, OFF EAST CAPE, 135 fms.

199. O. HUMILIS (LYMAN).

Ophiactis humilis LYMAN, 1869. Bull. M. C. Z., **1**, p. 329.
Ophiolebes humilis LYMAN, 1882. Challenger Oph., p. 202.

4 specimens, including HOLOTYPE and 2 PARATYPES. Florida: OFF SAND KEY, 125 fms.; off Sombrero Key, 240 fms.; OFF BAHIA HONDA KEY, 324 fms.

200. O. PACHYBACTRUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 242, f. 116.

2 specimens. Aleutian Islands: off Agattu, 482 fms.

201. O. PACHYPHYLAX, sp. nov. (παχύς, fat + φύλαξ, guard.) Plate **2**, f. 8, 9.

Disk, 9 mm. in diameter; arms five, about 20 mm. long. Disk well covered by low stumps, crowned with 4–6 minute spinelets. Radial shields narrow, somewhat concealed, but indicated by a pair of elevated, widely separated, parallel ridges at the base of each arm; at the distal end these may be quite bare. Upper arm-plates, rather small, rounded triangular, widely separated. Interbrachial spaces below, covered by numerous minute granules. Genital slits long and conspicuous. Oral shields small, diamond-shaped, rather wider than long. Adoral plates large, somewhat curved, nearly twice as long as wide. Oral papillae 5 or 6 on each side; the two distalmost are short, thick and ellipsoidal and stand on the outer, proximal corner of the adoral plate, guarding the large oral tentacle-pore (hence the name); of the remaining 3 or 4 papillae, the most proximal is largest but is somewhat smaller than a tooth, while the most distal is smallest and stands just within or above the first of the stout papillae protecting the oral pore. First under arm-plate rather large, rounded hexagonal; succeeding plates more or less pentagonal with rounded distal margin, at first wider than long, but becoming longer than wide distally; basally they are more or less in contact with each other. Side arm-plates rather large, meeting broadly above, even at base of arm, but more narrowly below and basally they are usually separated by the under arm-plates; each side arm-plate carries seven spines of which the uppermost is longest and exceeds two joints; it is smooth, terete, opaque; the three following are similar but successively shorter; the three lowest spines are abruptly smaller, subequal, blunt, and thorny. Tentacle-pores small; tentacle-scale single, small, more or less spiniform. Color (dried from alcohol), dirty whitish, disk somewhat darker.

Holotype (M. C. Z. 2128). East of Nantucket, 524 fms. Blake St. 306.

This specimen was not identified by Mr. Lyman but with it is a note in his handwriting: "*O. anomala* has 6 arms, this 5 and 1 more m. papilla than type. Also arm-spines more thorny." It seems to find its nearest ally in *O. trachybactra* from Bering Sea, which it resembles very closely except in the mouth-parts. In the curious pair of short, stout papillae standing guard over the oral tentacle-pore, this species is different from any ophiacanthid yet described. It is obviously not a typical Ophiolebes but it certainly belongs in the genus as used in the present paper.

202. O. PAUCISPINUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 246, f. 119.

7 paratypes. Bering Sea, 283 fms.

203. O. SCORTEUS Lyman, 1878. Bull. M. C. Z., **5**, p. 158, pl. 7, f. 196, 197.

4 paratypes. Antarctic Ocean: near Prince Edward Island, 310 fms.

204. O. TRACHYBACTRUS (H. L. Clark).
Ophiacantha trachybactra H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 206, f. 96.

2 paratypes. Off the Alaskan Peninsula, 625 fms.

205. O. TUBEROSUS Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 64.

1 cotype. Japan: Sagami Sea, Okinosé.

206. O. TYLOTUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 243, f. 117.

14 paratypes. Bering Sea, 55 fms. Aleutian Islands: off Agattu, 482 fms.; off Attu, 57–135 fms.

207. O. VESTITUS Lyman, 1878. Bull. M. C. Z., **5**, p. 159, pl. 10, f. 255–257.

2 cotypes. Patagonia: off west coast, 175 fms.

Species of Ophiolebes not represented in the M. C. Z.

208. O. ACANELLAE Verrill, 1885. Amer. journ. sci., ser. 3, **29**, p. 153. Off Nova Scotia.

Ophiacantha.

Müller and Troschel, 1842. Syst. Ast., p. 84, 106.

Type-species: *Ophiacantha spinulosa* Müller and Troschel, 1842. *op. cit.*, p. 107 = *Asterias bidentata* Retzius, 1805. Diss. Ast., p. 33. Type here first definitely designated.

209. O. ABNORMIS Lyman, 1879. Bull. M. C. Z., **6**, p. 59, pl. 15, f. 411–413.

6 cotypes. Philippine Islands, 700 fms.

210. O. ABYSSICOLA G. O. Sars, 1871. Vid.-selsk. Forh. f. 1871, p. 8. Grieg, 1894. Norske Nordh. exp. Oph., pl. 1, f. 6–10.

8 specimens, including 2 cotypes. Norway[1]: Lofoden, 200–300 fms. Faroe Channel, 312 fms. Off Nantucket, 304 fms.

211. O. ACANTHINOTATA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 203, f. 94.

3 paratypes. Japan: Gulf of Tokyo, 169 fms.

[1] Without definite locality.

212. O. ADIAPHORA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 199, f. 91.

4 PARATYPES. BERING SEA, 283–372 fms. OKHOTSK SEA: off Kamchatka, 682 fms.

213. O. ANCHILABRA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 204, f. 95.

2 PARATYPES. Japan: OFF OMAI SAKI LIGHT, 918 fms.

214. O. ANOMALA G. O. SARS, 1871. Vid.-selsk. Forh. f. 1871, p. 12. KOEHLER, 1914. Bull. 84 U. S. N. M., pl. 15, f. 3–5.

5 specimens. Scandinavia. Off Georges Bank, 131 fms.

215. O. ASPERA LYMAN, 1878. Bull. M. C. Z., **5**, p. 228, pl. 1, f. 10–12.

21 specimens, including HOLOTYPE and 4 PARATYPES. Cuba: OFF HAVANA, 175–400 fms. Off Montserrat, 88–148 fms. Off Guadeloupe, 183 fms. Off St. Lucia, 151 fms. Off St. Vincent, 124 fms. Off the Grenadines, 164 fms. Off Grenada, 262 fms. Off Barbados, 73 fms.

216. O. BAIRDI LYMAN, 1883. Bull. M. C. Z., **10**, p. 256, pl. 5, f. 70–72.

28 specimens, including HOLOTYPE and 1 PARATYPE. OFF CAPE COD, 1242 fms. SOUTH OF MARTHAS VINEYARD, 1394 fms. Bering Sea, 850 fms. Off Washington, 636 fms. California, northwest of San Nicolas Island, 451 fms.

217. O. BATHYBIA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 233, f. 110.

40 specimens, including 37 PARATYPES. OFF ALASKA, 1569 fms. Alaska: OFF SHUMAGIN ISLANDS, 1973 fms. Lower California: off Point San Tomas, 868 fms.

218. O. BIDENTATA (RETZIUS).

Asterias bidentata RETZIUS, 1805. Diss. Ast., p. 33.

Ophiacantha bidentata LJUNGMAN, 1872. Öfv. Kongl. vet.-akad. Förh., **28**, p. 652. LÜTKEN, 1858, Add. ad hist. Oph., pt. 1, pl. 2, f. 14 (as *O. spinulosa*). KOEHLER, 1909, Princesse-Alice Echinod., pl. 6. f. 3 (colored).

135 specimens. Spitzbergen[1]: Treurenberg Bay, 70 fms. Greenland. Karahavet. Norway. Labrador: 3 miles south of Caribou Island, 50 fms. New Brunswick: Grand Manan, off Duck Island, 18–20 fms. Maine, Eastport. Off Georges Bank, 220 fms. East of Cape Cod, 980–1242 fms. Southeast of Nantucket, 1350 fms. South of Marthas Vineyard, 1002–1394 fms. East of New Jersey, 1241 fms. Off Delaware, 922–1186 fms. Off South Carolina, 1386 fms. Gulf of Tartary, 318 fms. Sea of Japan, 163–245 fms.

[1] Without definite locality.

219. O. CATALEIMMOIDA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 217, f. 100.

116 PARATYPES. Off Alaskan Peninsula, 138–625 fms. Japan: off Omai Saki Light, 624 fms.

220. O. COMPOSITA Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 350, pl. 8, f. 64, 65.

2 specimens. Dutch East Indies: north of Sumbawa, 441 fms.

221. O. CONFUSA Koehler, 1905. Siboga-exp. Oph. litt., p. 59, pl. 7, f. 9–11.

2 specimens. Torres Strait: Murray Islands, Mer, southwest reef.

222. O. CONTIGUA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 173, pl. 17, f. 7–9.

1 COTYPE. Gulf of Panama: off Malpelo Island, 899 fms.

223. O. COSMICA Lyman, 1878. Bull. M. C. Z., **5**, p. 146, pl. 10, f. 251, 252.

12 specimens, including 9 COTYPES. South of Marthas Vineyard, 1394 fms. Brazil: off Bahia, 358 fms. Gulf of Panama: off Mariato Point, 1672 fms. Chile: off Valparaiso, 2160 fms. North of New Guinea, 1070 fms. West of Crozet Islands, 1600 fms. Antarctic Ocean, 1675 fms.

224. O. COSTATA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 172, pl. 17, f. 4–6.

2 COTYPES. Mexico: near Las Tres Marias Islands, 676 fms.

225. O. CURIMA, sp. nov. (*κούριμος*, shorn, cropped). Plate **3**, f. 1, 2.

Disk, 5 mm. in diameter; arms about 20 mm. long. Exactly like *O. vepratica* Lyman (from near the Kermadec Islands) save in three particulars; the lower arm-spines are smooth and slender like those above them, though somewhat shorter, while in *vepratica* they are stouter and, at least at the middle of the arm, are minutely thorny, under a lens. The oral papillae are flat and thin, not thickened as in *vepratica*. The disk is covered with a very close and even coat of crowded granules (hence the name) among which, at the center, are a few distinct slender spines; in *vepratica* the granules are larger, rougher at the tip, well-spaced, and much larger at the center of the disk than at the margins.

Holotype (M. C. Z. 2029) and 1 paratype (M. C. Z. 2030). Gulf of Mexico: south of the Tortugas, 860 fms. Blake St. 41.

These are the two specimens recorded by Lyman in 1878, Bull. M. C. Z., **5**, p. 230, as *O. vepratica*. Later in working over the Blake material, Mr. Lyman recorded *vepratica* from a number of stations. Most of the labels with the specimens however have a question mark and some have notes on peculiar

characteristics. These specimens are identical with those listed as *vepratica* by Koehler (1914, Bull. 84 U. S. N. M., p. 94) but are not the same as the Pacific species, nor are they similar to the two ophiurans from the Tortugas here described. They are further discussed, under the name *metallacta* (*q. v.*). While the three species are no doubt nearly related, in the present state of our knowledge, it is important that they should not be confused with each other.

226. O. CUSPIDATA LYMAN, 1878. Bull. M. C. Z., **5**, p. 143, pl. 10, f. 248–250.

4 COTYPES. Atlantic Ocean: OFF ASCENSION ISLAND, 420 fms.

227. O. DALLASII DUNCAN, 1879. Journ. Linn. soc. Zool., **14**, p. 471, pl. 11, f. 25–27.

1 specimen. Dutch East Indies: Celebes, Kwandang Bay, 46 fms.

228. O. DENSA FARRAN, 1913. Fish. Ireland sci. inv., no. 6, p. 40, f. 12, 13.

5 COTYPES. OFF SOUTHWESTERN IRELAND, 627–728 fms.

229. O. DIPLASIA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 209, f. 97.

19 PARATYPES. OFF OREGON, 53–59 fms. OFF CALIFORNIA, 69 fms.

230. O. DIPLOA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 207.

1 PARATYPE. OFF SOUTHERN JAPAN, 437 fms.

231. O. DISCOIDEA LYMAN, 1879. Bull. M. C. Z., **6**, p. 57, pl. 15, f. 405–407.

4 specimens. Torres Strait: Murray Islands, Mer, off west reef, 5 fms.

232. O. ECHINULATA LYMAN, 1878. Bull. M. C. Z., **5**, p. 229, pl. 1, f. 7–9.

6 specimens, including the HOLOTYPE. Gulf of Mexico: WEST OF TORTUGAS, 955 fms. Off Montserrat, 303 fms. Off Dominica, 333 fms. Off Martinique, 334 fms. Off Grenada, 955 fms.

233. O. EURYPOMA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 223, f. 103.

1 PARATYPE. OFF ALASKA, 1569 fms.

234. O. FRATERNA VERRILL, 1885. Rept. U. S. F. C. for 1883, p. 545. Plate **3**, f. 3, 4.

1 specimen. Southeast of New England, 1234–1422 fms.

235. O. GRANULOSA LYMAN, 1878. Bull. M. C. Z., **5**, p. 138, pl. 8, f. 206–208.

5 specimens, including 3 COTYPES. Japan: off east coast, 52–77 fms.; southwest of Goto Islands, 95 fms. Philippine Islands: WEST OF MINDANAO, 82–102 fms.

236. O. GRATIOSA KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 346, pl. 8, f. 60, 61.

2 COTYPES. LACCADIVE SEA, 444 fms.

237. O. HETEROTYLA H. L. CLARK, 1909. Mem. Austr. mus., **4**, p. 542, pl. 52, f. 4–6.

9 PARATYPES. New South Wales: OFF WATA MOOLI, 54–59 fms.

238. O. HIRSUTA LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 12, pl. 2, f. 21–23.

25 specimens, including HOLOTYPE and 1 PARATYPE. Florida: OFF SOMBRERO KEY, 240 fms. Cuba: off Havana, 127–175 fms. Jamaica: off Port Royal, 100 fms. Off Montserrat, 88 fms. Off Guadeloupe, 150 fms. Off Dominica, 441 fms. Off Martinique, 317 fms. Off St. Lucia, 226 fms. Off Milligans Key (near St. Vincent), 124 fms. Off Grenada, 461 fms. Off BARBADOS, 82–200 fms.

239. O. IMAGO LYMAN, 1878. Bull. M. C. Z., **5**, p. 139. 1882. Challenger Oph., pl. 25, f. 4–6.

2 COTYPES. OFF HEARD ISLAND, 150 fms.

240. O. INCONSPICUA LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 168, pl. 15, f. 7–11.

2 COTYPES. GULF OF PANAMA, 1020 fms.

241. O. INDICA LJUNGMAN, 1867. Öfv. Kongl. vet.-akad. Förh., **23**, p. 326. KOEHLER, 1898. Bull. sci. **31**, pl. 5, f. 44–46 (as *O. decora*).

1 specimen. Dutch East Indies: Banda.

242. O. INUTILIS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 111, pl. 21, f. 6–8.

1 specimen. Japan: Uraga Channel, 197 fms.

243. O. LAMBDA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 231, f. 108.

1 PARATYPE. Japan: BUNGO CHANNEL, 437 fms.

244. O. LASIA, sp. nov. (λάσιος, hairy). Plate **1**, f. 5.

Disk, 9 mm. in diameter; arms, 27 mm. long. Disk covered, closely but not densely, with slender spinules, .6–.8 mm. long (hence the name), terminating in 2, or sometimes 3, long teeth; when there are 2 teeth, the spinules are distinctly flattened at tip. Radial shields wholly concealed. Upper armplates somewhat wider than long, triangular, with broadly curved distal margin, barely in contact at base of arm. Interbrachial areas below, covered like the disk with small, thin scales, bearing long, slender spinules. Genital slits large, extending nearly to disk-margin. Oral shields broadly triangular, with rounded angles, rather wider than long; distal margin more or less protuberant. Adoral plates slender, 3 or 4 times as long as wide, meeting within; an ell at the distal

end more or less separates the oral shield from the first side arm-plates. Oral plates larger than adorals; on the margin are 6 or 7 small, pointed oral papillae, the most proximal largest and most distal smallest. Three or four broad, bluntly pointed teeth are on the angle of the jaw, but no true tooth-papillae. On one of the adoral plates is a small, flat papilla guarding the very large oral tentacle-pore; apparently there were two or three such papillae on each adoral plate but they have been rubbed off. First under arm-plate fairly large, indistinctly pentagonal, the distal side shortest; second plate much larger, pentagonal; succeeding plates more or less hexagonal, nearly or quite in contact until far out on arm, after the fourth or fifth becoming longer than wide and with a distinct median notch on distal margin. Side arm-plates not conspicuous, meeting above and below very narrowly and indefinitely; each plate bears 6 or 7 fragile, slender, nearly smooth arm-spines of which the next to the uppermost is longest and may equal two arm-joints. Tentacle-scales thin, flat, and pointed; there are two at each pore on the basal arm-joints but only one, on the middle and distal joints. Color, pale brown.

Holotype (M. C. Z. 2042). Japan: Uraga Channel, about 200 fms. Owston collection.

This specimen is not very near any species hitherto described except *hirta* Lütk. & Mort. from the west coast of Mexico. Its affinities are clearly with the West Indian species *hirsuta* Lyman and *ensifera* Verrill and it would thus fall in Verrill's proposed genus Ophiopristis, a group which I am not yet prepared to recognize. From *hirta*, it appears to differ in a number of details, the most important of which are the form of the under arm-plates and the armature of the jaws.

245. O. LEVISPINA Lyman, 1878. Bull. M. C. Z., **5**, p. 147. 1882. Challenger Oph., pl. 25, f. 1–3.

19 specimens. Japan: off Omai Saki Light, 624 fms.; Bungo Channel, 720 fms.; off Kagoshima Gulf, 361 fms. Sea of Japan, 224–248 fms. Eastern Sea, 440 fms.

246. O. MACROPLACA sp. nov. (μακρός, long + πλάξ, a plate). Plate **1**, f. 6, 7.

Disk 2 mm. in diameter; arms, 10–11 mm. long. Disk covered with minute scales each of which bears a low, round granule; here and there one of these granules is elongated into a pointed spinelet. Radial shields concealed or their distal ends somewhat exposed. Upper arm-plates longer than wide (hence the name) quadrilateral (or triangular with proximal angle more or less truncated), much wider distally than proximally, more or less in contact throughout; distal

margin broadly curved. Interbrachial areas below, finely scaled but without granules. Genital slits long reaching nearly to disk-margin. Oral shields, large, oval, a trifle longer than wide. Adoral plates small, triangular, barely meeting within, longer than their outer (basal) width. Oral plates rather large, each with 4 small flat oral papillae on the margin; of these papillae the middle 2 are smaller than the most proximal or the distalmost; the last is largest of all. There are 3 or 4 teeth but no true tooth-papillae. First under arm-plate very small, quadrilateral, narrowest distally; succeeding plates longer than wide, broadly in contact throughout, quadrilateral, narrowest proximally, with distal margin curved. Side arm-plates small, not projecting nor meeting either above or below; each carries four smooth, slender, tapering spines, of which the lowest is shortest, the uppermost longest; the latter equals two arm-joints. Tentacle-scale large, single, flat. Color:— disk-scales, gray; granules, brownish; spinelets, whitish; arms, dull purplish, banded with a very light shade, each band about 2 joints wide, each interval about 3 joints; nearly all the arm-plates, both upper and under, have a whitish spot at the middle of the distal end and a large one proximally (either spot may be wanting); arm-spines and tentacle-scales, pale.

HOLOTYPE (M. C. Z. 3700). Hawaii: HILO. Carnegie Exp., 1913. H. L. Clark coll.

This pretty little brittle-star was collected on the under side of a stone, on a shore-reef south of Hilo, Dec. 10, 1913. It had the general appearance of an Ophiactis, quite in accord with its environment, but it is evidently an ophiacanthid. No doubt it is young but there is no reason for supposing the adult is essentially different. It is well characterized by the number and arrangement of the oral papillae and the form of the arm-plates.

247. O. MARSUPIALIS LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 13, pl. 1, f. 9, 10.

HOLOTYPE and 1 PARATYPE. JUAN FERNANDEZ, 240 fms.

248. O. MESEMBRIA, sp. nov. (*μεσημβρία*, the south).

Ophiacantha meridionalis KOEHLER, 1914. Bull. 84 U. S. N. M., p. 91, pl. 9, f. 1, 2. *non* LYMAN, 1869. Bull. M. C. Z., **1**, p. 324.

Disk, 5 mm. in diameter; arms 30–35 mm. long. In general very similar to *O. pentacrinus* Lütken but with disk more distinctly circular and covered with thorny spinules rather than with thorn-crowned stumps. The important distinction is found in the outer (distalmost) oral papilla which is broad and flat in *mesembria* while in *pentacrinus* it is not different from its two fellows. Color of dry and alcoholic material, nearly white.

HOLOTYPE (M. C. Z. 3918) and 19 PARATYPES (M. C. Z. 3919–3923). OFF ST. CRUZ, D. W. I., 508–625 fms. OFF DOMINICA, 372–390 fms. OFF MARTINIQUE, 317–502 fms. OFF GRENADA, 416 fms. OFF BARBADOS, 140–221 fms.

Koehler (*loc. cit.*) has called attention to the fact that two West Indian ophiurans are confused under the name *pentacrinus* and he proposes to reinstate Lyman's name *meridionalis* for the form which is not true *pentacrinus*. Unfortunately an examination of Lyman's types of *meridionalis* shows that they are all true *pentacrinus* as Lyman himself decided in 1871 (Illus. cat. M. C. Z., no. 6, p. 7), and consequently the name *meridionalis* is a pure synonym of *pentacrinus* and cannot be used for any other species. I therefore propose *mesembria*, the Greek equivalent of *meridionalis*, for the form with the broad outer oral papillae. The species was taken at a number of the BLAKE stations but was not distinguished from *pentacrinus* by Mr. Lyman and hence the Paris Museum (as recorded by Koehler) received some specimens labeled *pentacrinus*.

249. O. METALLACTA, sp. nov. (μεταλλακτός, changed).

Ophiacantha vepratica KOEHLER, 1914. Bull. 84 U. S. N. M., p. 94, pl. 13, f. 6. *non* LYMAN, 1878. Bull. M. C. Z., **5**, p. 137.

Disk, 5 mm. in diameter; arms, 25–30 mm. long. Very similar to *O. vepratica* Lyman but easily distinguished by the disk covering which consists of coarse, spaced, thorn-crowned granules, with no spinules whatever.

HOLOTYPE (M. C. Z. 2036) and 15 PARATYPES (M. C. Z. 2037–2041, 2044, 2221). OFF SOUTH CAROLINA, 257 fms. OFF NEVIS, 356 fms. OFF MARTINIQUE, 334 fms. OFF ST. LUCIA, 164 fms. OFF ST. VINCENT, 424 fms. OFF GRENADA, 291 fms. OFF BARBADOS, 399 fms.

This species which Koehler (*loc. cit.*) has satisfactorily described and figured as *vepratica* is not that species (hence the *changed* name). In studying the BLAKE collections, Mr. Lyman found a number of specimens, which he labeled "vepratica?" but occasionally the question mark was omitted. With these specimens are various little notes, as follows: "Ophiacantha sp. nov.? Somewhat *cuspidata*. 7–8 slightly thorny spines. Stumps on disk with crown of thorns. Wait more and better spec." "Ophiomitra valida ? *young*." "Similar to #139 but 1 tent. scale and 7 m. papillae." For some reason, he sent one of these dubious BLAKE specimens to the Paris Museum with no question mark on the label. Naturally Koehler assumed that it was an authentic specimen of *vepratica* and accordingly identified similar West Indian brittle-stars as that Pacific species. A comparison of the descriptions and figures given by Lyman

and by Koehler is sufficient to show how different the two species are. The disk covering in particular is an excellent distinguishing character. As stated above (p. 198), the species *curima*, *metallacta*, and *vepratica* are nearly related, but *metallacta* is less like either of the others than they are like each other. It has no spinules on the disk, while they normally do.

250. O. MILLESPINA Verrill, 1879. Proc. U. S. N. M., **2**, p. 203. Plate **3**, f. 5, 6.

9 specimens. East of Cape Cod, 306–524 fms. Off Newport, 192 fms. Off Maryland, 1423 fms.

251. O. MONILIFORMIS Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 171, pl. 17, f. 5–8.

4 specimens, including 3 COTYPES. Lower California: southwest of San Cristobal Bay, 284 fms. Mexico: NEAR LAS TRES MARIAS ISLANDS, 676–680 fms.

252. O. NORMANI Lyman, 1879. Bull. M. C. Z., **6**, p. 58, pl. 15, f. 414–416.

335 specimens, including 4 COTYPES. Bering Sea, 764 fms. Off British Columbia, 876 fms. Off Washington, 477–786 fms. California: southwest of Monterey Bay, 659 fms.; southwest of Santa Rosa Island, 534 fms.; southwest of Santa Cruz Island, 640 fms. Gulf of California, 905 fms. Japan: south coast of Hokkaido, 464 fms.; off Omai Saki Light, 662 fms.; SAGAMI SEA, 345 fms.

253. O. OEDIDISCA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 219, f. 101.

2 PARATYPES. Japan: OFF EAST COAST, 544–545 fms.; Bungo Channel, 405–578 fms.

254. O. OMOPLATA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 202, f. 93.

1 PARATYPE. SEA OF JAPAN: OFF KOREA, 163 fms.

255. O. PACIFICA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 166, pl. 15, f. 4–6.

13 COTYPES. OFF ECUADOR, 1573 fms.

256. O. PENTACRINUS Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 46. Koehler, 1914. Bull. 84 U. S. N. M., pl. 9, f. 3, 4.

166 specimens, including 5 cotypes of *O. meridionalis* Lyman. Off South Carolina, 257 fms. Florida: off Florida Keys, 237 fms.; off Sand Key, 128 fms.; south of Marquesas Key, 296 fms.; northwest of the Tortugas, 339–539 fms. Cuba: off Havana, 175 fms. Off St. Cruz, D. W. I., 451–625 fms. Off Dominica, 333–390 fms. Off Martinique, 317–502 fms. Off St. Lucia, 422–

423 fms. Off St. Vincent, 424–573 fms. Off the Grenadines, 338 fms. Off Grenada, 92–416. Off Barbados, 82–221 fms.

257. O. PENTAGONA Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 342, pl. 8, f. 56, 57.

26 specimens. Japan: Suruga Gulf, 124 fms.; off east coast, 63–100 fms.; off southeast coast, 244–253 fms.; southwest of Goto Islands, 95–106 fms. Eastern Sea, 361 fms. Dutch East Indies: Celebes; off Macassar, 250 fms.

258. O. PERFIDA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 118, pl. 22, f. 5, 6.

1 cotype. Dutch East Indies: between Flores and Sumba, 533 fms.

259. O. RELICTA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 106, pl. 17, f. 4–6.

1 cotype. Dutch East Indies: Celebes; off Dongala, 403 fms.

260. O. RHACHOPHORA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 201, f. 92.

18 specimens, including 14 paratypes. Bering Sea, 584 fms. California: northwest of San Nicolas Island, 451 fms. Sea of Japan, 90–207 fms. Japan: southwest of Goto Islands 139 fms.; Sagami Sea, about 200 fms.

261. O. ROSEA Lyman, 1878. Bull. M. C. Z., **5**, p. 139, pl. 10, f. 267, 268.

7 cotypes. West coast of Patagonia, 175 fms.

262. O. SCUTATA Lyman, 1878. Bull. M. C. Z., **5**, p. 229, pl. 1, f. 1–3.

19 specimens, including holotype and 1 paratype. Cuba: off Morro Light, 292 fms.; west of Havana, 287 fms. Off St. Cruz, D. W. I., 248 fms. Off St. Kitts, 208–270 fms. Off Guadeloupe, 150 fms. Off Dominica, 250 fms. Off Grenadines, 127 fms. Off Grenada, 154 fms. Off Barbados, 288 fms.

263. O. SENTOSA Lyman, 1878. Bull. M. C. Z., **5**, p. 140, pl. 9, f. 229–232.

1 cotype. Chile: off Valparaiso, 2225 fms.

264. O. SETOSA (Retzius).

Asterias setosa Retzius, 1805. Diss. Ast., p. 30.
Ophiacantha setosa Müller and Troschel, 1842. Syst. Ast., p. 106, pl. 8, f. 2.

29 specimens. Naples. France: Gironde, Panillac. Algeria: Oran.

265. O. SOCIABILIS Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 348, pl. 8, f. 62, 63.

1 cotype. Bay of Bengal, 1803 fms.

266. O. SPECTABILIS G. O. Sars, 1871. Vid-selsk. Förh. f. 1871, p. 10. Grieg, 1902. Bergens mus. Aarbog, no. 1, p. 14, figures.

2 specimens, including 1 cotype. Norway [1]: Bodö, 100 fms.

[1] Without definite locality.

267. O. SPHAERULATA (PENNANT).

Asterias sphaerulata PENNANT, 1777. Brit. zool., **4**, p. 63, pl. 32, f. 63.
(*Ophiocoma nigra* MÜLLER and TROSCHEL, 1842, *et auct. omnes post*).

26 specimens. Greenland. Norway. Cattegat, 5 fms. Near British Isles, 53 fms. Scotland: Oban. Wales: Milford. France: Brest.

268. O. SPINIFERA LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 169, pl. 17, f. 1–3.

1 COTYPE. GULF OF PANAMA, 1020 fms.

269. O. STELLATA LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 11, pl. 2, f. 16–18.

32 specimens, including HOLOTYPE and 1 PARATYPE. Off Montserrat, 85 fms. Off Dominica, 118 fms. Off St. Vincent, 174 fms. Off BARBADOS, 56–100 fms.

270. O. TENUIS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 102, pl. 16, f. 5–7.

1 COTYPE. KEI ISLANDS: SOUTH OF TAAM ISLAND, 169 fms.

271. O. VALENCIENNESI LYMAN, 1879. Bull. M. C. Z., **6**, p. 57, pl. 15, f. 408–410. KOEHLER, 1909, Princesse-Alice Echinod., pl. 6, f. 2 (colored).

2 specimens. Off St. Cruz, D. W. I., 218 fms. Off Barbados, 237 fms.

272. O. VEPRATICA LYMAN, 1878. Bull. M. C. Z., **5**, p. 137, pl. 10, f. 245–247.

1 COTYPE. NORTHEAST OF THE KERMADEC ISLANDS, 600 fms.

273. O. VIVIPARA LJUNGMAN, 1870. Öfv. Kongl. vet.-akad. Förh., **27**, p. 471. WYVILLE THOMSON, 1877. The Atlantic, **2**, p. 242, f. 50.

26 specimens. Strait of Magellan, 55 fms. Kerguelen: Christmas Harbor; Royal Sound, 28 fms.

Species of Ophiacantha not represented in the M. C. Z.

274. O. ACULEATA VERRILL, 1885. Amer. journ. sci., ser. 3, **29**, p. 153. KOEHLER, 1914. Bull. 84 U. S. N. M., pl. 11, f. 1, 2. Off Marthas Vineyard, 1346 fms. Off Chesapeake Bay, 1395 fms.

275. O. AFFINIS KOEHLER, 1914. Bull. 84 U. S. N. M., p. 99, pl. 12, f. 1–3. Cuba: off Havana, 200–278 fms.

276. O. AMERICANA (KOEHLER), 1914. Bull. 84 U. S. N. M., p. 103, pl. 15, f. 1, 2 (*Ophiomitrella*). Loc.?

277. O. ANTARCTICA KOEHLER, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 34, pl. 4, f. 23–25. West Antarctica, 55–334 fms.

278. O. ARISTATA KOEHLER, 1895. Rev. biol. Nord France, **7**, p. 467, f. 8. Bay of Biscay, 945 fms.

279. O. ATOPOSTOMA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 228, f. 107. Bering Sea, 344–372 fms.

280. O. AUDAX KOEHLER, 1905. Siboga-exp. Oph. litt., p. 57, pl. 7, f. 1–4. Dutch East Indies: Flores, Madura Bay.

281. O. AUGUSTA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 105, pl. 19, f. 5, 6. Dutch East Indies: Molucca Passage, 647–702 fms.; off east end of Timor, 680 fms.

282. O. BARBARA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 133, pl. 26, f. 2, 3, pl. 27, f. 1 (*Ophiomitrella*). Dutch East Indies: near Kei Islands, 173 fms.

283. O. BISQUAMATA Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 62. Japan: Sagami Sea, off Oshima, 75–80 fms.

284. O. BREVISPINA Koehler, 1898. Hirondelle Ech. et Oph., p. 56, pl. 8, f. 43; pl. 9, f. 44. Bay of Biscay, 93 fms.

285. O. CLANDESTINA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 108, pl. 19, f. 1–4. Dutch East Indies: Strait of Macassar, 364–402 fms.

286. O. CLAVIGERA Koehler, 1907. Fauna Südwest-Australiens, **1**, p. 247, f. 1. West Australia: Cockburn Sound, 3–5 fms.; Koombana Bay, 7–10 fms.

287. O. CORNUTA Lyman, 1878. Bull. M. C. Z., **5**, p. 145, pl. 10, f. 266. 1882. Challenger Oph., pl. 15, f. 3–5. Kermadec Islands, 520–600 fms. Fiji Islands, 600 fms.

288. O. CRASSIDENS Verrill, 1885. Amer. journ. sci., ser. 3, **29**, p. 152. Koehler, 1909. Princesse-Alice Echinod., pl. 26, f. 9–11. Off Cape Hatteras, 843 fms.

289. O. DECIPIENS Koehler, 1906. Mem. Soc. zool. France, **19**, p. 22, pl. 2, f. 26, 27. Near the Azores, 700 fms.

290. O. DERUENS Koehler, 1907. Bull. sci., **41**, p. 318, pl. 12, f. 36, 37. Strait of Magellan.

291. O. DISSIDENS Koehler, 1905. Siboga-exp. Oph. litt., p. 56, pl. 7, f. 12–15. Dutch East Indies: Celebes Sea, 6 fms.

292. O. DUPLEX Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 352, pl. 8, f. 66, 67. Ceylon: off Colombo, 386 fms.

293. O. ENNEACTIS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 211, f. 98. Bering Sea, 482 fms.

294. O. ENOPLA Verrill, 1885. Amer. journ. sci., ser. 3, **29**, p. 153. Off east coast of United States, 351–640 fms.

295. O. ENSIFERA (Verrill), 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 47, pl. 4 (*Ophiopristis*). Cuba: off Havana, 110–260 fms.

296. O. EUPHYLACTEA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 225, f. 105. Japan: Hondo Island, off Manazuru Saki, 120–265 fms.

297. O. FAUSTA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 104, pl. 20, f. 2, 3. Dutch East Indies: near Kei Islands, 170 fms.

298. O. FICTA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 121, pl. 16, f. 1–4. Dutch East Indies: west of Kei Islands, 114 fms.

299. O. FRIGIDA Koehler, 1907. Zool. anz., **32**, p. 147. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 608, pl. 14, f. 123–125. Antarctic Ocean: south of South America, 784–985 fms.

300. O. GLOBULIFERA (Koehler), 1895. Rev. biol. Nord France, **7**, p. 469, f. 9 (*Ophiomitra*). Bay of Biscay, 956 fms.

301. O. GRANULIFERA Verrill, 1885. Amer. journ. sci., ser. 3, **29**, p. 153. Koehler, 1914. Bull. 84 U. S. N. M., pl. 10, f. 2, 3. Off Nova Scotia, 101–200 fms.

302. O. HIBERNICA Farran, 1913. Fish. Ireland sci. inv., no. 6, p. 39, f. 10, 11. Off southwestern Ireland, 982 fms.

303. O. HIRTA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 174, pl. 17, f. 5–8. Entrance to the Gulf of California, 680–852 fms.

304. O. HYLACANTHA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 227, f. 106. Japan: off Omai Saki Light, 918 fms.

305. O. IMPERITA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 114, pl. 17, f. 1–3. Dutch East Indies: off Aru Islands, 994 fms.

306. O. INGRATA (Koehler), 1907. Zool. anz., **32**, p. 147. 1908. Trans. Roy soc. Edinburgh, **46**, p. 613, pl. 14, f. 126, 127 (*Ophiomitrella*). Antarctica: off Gough Island, 100 fms.

307. O. LANGUIDA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 135, pl. 29, f. 2, 3 (*Ophiomitrella*). Dutch East Indies: Celebes, off Macassar, 250 fms.

308. O. LEPIDOTA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 224, f. 104. Off Alaska, 625 fms.

309. O. LEUCORHABDOTA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 221, f. 102. Eastern Sea, 103–152 fms.

310. O. LEVIS (Koehler), 1914. Bull. 84 U. S. N. M., p. 105, pl. 10, f. 1 and 6 (*Ophiomitrella*). Off Georgia, 270 fms.

311. O. LINEATA Koehler, 1896. Mem. Soc. zool. France, **9**, p. 247. 1909. Princesse-Alice Echinod., pl. 25, f. 6–8. Vicinity of the Azores, 647 fms.

312. O. LONGIDENS Lyman, 1878. Bull. M. C. Z., **5**, p. 144. 1882. Challenger Oph. pl. 25, f. 7–9. Philippine Islands: off Cebu, 95–100 fms.

313. O. LOPHOBRACHIA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 232, f. 109. Eastern Sea, 152 fms.

314. O. LUCTUOSA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 115, pl. 20, f. 4, 5. Dutch East Indies: off Rotti, 120 fms.

315. O. MACRARTHRA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 236, f. 112. Bering Sea, 584 fms.

316. O. MATURA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 112, pl. 23, f. 2–4. Dutch East Indies: near Kei Islands, 443 fms.

317. O. MUTATA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 134, pl. 30, f. 1, 2 (*Ophiomitrella*). Dutch East Indies: near Kei Islands, 114–170 fms.

318. O. NODOSA Lyman, 1878. Bull. M. C. Z., **5**, p. 144, pl. 10, f. 258–261. Southwest from the Canary Islands, 1530 fms.

319. O. NOTATA Koehler, 1906. Mem. Soc. zool. France, **19**, p. 23, pl. 2, f. 28–30. Off northwestern Spain, 681 fms.

320. O. OPERCULARIS (Koehler), 1907. Bull. 99 Inst. ocean., p. 43. 1909. Princesse-Alice Echinod., pl. 27, f. 9, 10 (*Ophiolimna*). Southwest from the Cape Verde Islands, 3209 fms.[1]

321. O. OPHIACTOIDES H. L. Clark, 1901. Bull. U. S. F. C., **2**, p. 249, pl. 15, f. 5–8. Porto Rico: Gallardo Bank, 10 fms.

322. O. OPULENTA Koehler, 1907. Zool. anz., **32**, p. 147. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 610, pl. 14, f. 128, 129. Antarctic Ocean: southeast from South America, 1775 fms.

323. O. PARCITA Koehler, 1906. Mem. Soc. zool. France, **19**, p. 25, pl. 2, f. 33–35. Vicinity of the Cape Verde Islands, 332–352 fms.

324. O. PLACENTIGERA Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 9, pl. 2, f. 20–22. Near the Fiji Islands, 1350 fms.

325. O. PLACIDA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 137, pl. 31, f. 3, 4 (*Ophiomitrella*). Dutch East Indies: near Kei Islands, 114–170 fms.; near Rotti, 120 fms.

326. O. POLARIS Koehler, 1900. Bull. Acad. Belgique, p. 820. 1901. Belgica Ech. & Oph., p. 32, pl. 3, f. 19–21. West Antarctica, 55–168 fms.

327. O. PORRECTA (Koehler), 1914. Bull. 84 U. S. N. M., p. 107, pl. 12, f. 5, 6 (*Ophiomitrella*). Southern Chile: near Queen Adelaide Island, 369 fms.

328. O. PRIONOTA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 213, f. 99. Off southern Japan, 1008 fms.

329. O. PROCERA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 113, pl. 22, f. 1, 2. Dutch East Indies: near Kei Islands, 330 fms.

330. O. RASCHII (G. O. Sars), 1872. Vid.-selsk. Förh., f. 1871, p. 109 (*Ophiocoma*). Norway, 100 fms.

331. O. ROBUSTA (Koehler), 1914. Bull. 84 U. S. N. M., p. 108, pl. 10, f. 4, 5 (*Ophiomitra*). Cuba: off Havana, 120 fms.

332. O. SEGESTA Lyman, 1878. Bull. M. C. Z., **5**, p. 141. 1882. Challenger Oph., pl. 15, f. 1, 2. Near Bermuda, 1075 fms.

333. O. SERRATA Lyman, 1878. Bull. M. C. Z., **5**, p. 148. 1882. Challenger Oph., pl. 15, f. 6–8. Near Admiralty Islands, 152 fms.

334. O. SIMULANS Koehler, 1895. Rev. biol. Nord France, **7**, p. 465, f. 7. Bay of Biscay, 945 fms.

335. O. SMITTI Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 621. Off Portugal, 790 fms.

[1] The data as to the year and the depth of the collection of the unique holotype of this species are very different in the preliminary paper from those given in the final report. I assume that the latter are correct.

336. O. STIMULEA LYMAN, 1878. Bull. M. C. Z., **5**, p. 141, pl. 9, f. 225–228. Off New South Wales, 950 fms.

337. O. SUSPECTA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 58, pl. 7, f. 5–8. Dutch East Indies: Flores, Bay of Madura, 38 fms.

338. O. VAGANS KOEHLER, 1898. Bull. sci., **31**, p. 82, pl. 4, f. 27, 28. India: off coast of Ganjam, 28 fms. Burma: Torres Islands, 40 fms.

339. O. VARISPINA VERRILL, 1885. Rept. U. S. F. C. for 1883, p. 545. Off Nova Scotia, 101 fms.

340. O. VESTITA KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 344, pl. 8, f. 58, 59. Andaman Islands, 250 fms. India: Coromandel coast, 195–210 fms.

341. O. VETERNA KOEHLER, 1907. Bull. 99 Inst. ocean., p. 41. 1909. Princesse-Alice Echinod., pl. 29, f. 3, 4. Near the Azores, 1220–1367 fms. Near Madeira Islands, 1094 fms.

342. O. VORAX KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 353, pl. 9, f. 68, 69. India: off Cape Comorin, 1043 fms.

OPHIOTHAMNUS.

LYMAN, 1869. Bull. M. C. Z., **1**, p. 341.

Type-species: *Ophiothamnus vicarius* LYMAN, 1869. *op. cit.*, p. 342. Monotypic when established.

343. O. ACONTOPHORUS (H. L. CLARK).
Ophiomitra acontophora H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 190, f. 88.

12 PARATYPES. OFF ALASKAN PENINSULA, 625 fms. OFF ALEUTIAN ISLANDS, 1217 fms.

344. O. CHARIIS, nom. nov. (χαρίεις, graceful).
Ophiacantha gracilis VERRILL, 1885. Rept. U. S. F. C. for 1883, p. 548.
Ophiothamnus gracilis VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 41. (*non* Studer, 1882).

1 specimen. Loc.? U. S. F. C. coll., 1878.

345. O. EXIGUUS (LYMAN).
Ophiomitra exigua LYMAN, 1878. Bull. M. C. Z., **5**, p. 231, pl. 1, f. 4–6.
Ophiothamnus exigua VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 41.

4 specimens, including the HOLOTYPE. Cuba: OFF HAVANA, 240–400 fms.

346. O. HABROTATUS (H. L. CLARK).
Ophiomitra habrotata H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 182, f. 83.

2 PARATYPES. Japan: SOUTHWEST OF GOTO ISLANDS, 139 fms.

347. O. REMOTUS LYMAN, 1878. Bull. M. C. Z., **5**, p. 149, pl. 8, f. 201–203.

1 COTYPE. Off Cape Colony: AGULHAS BANK, 150 fms.

348. O. VENUSTUS MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 63.

1 COTYPE. Japan: SAGAMI SEA, off Inatori.

349. O. VICARIUS LYMAN, 1869. Bull. M. C. Z., **1**, p. 342. 1871. Illus. cat. M. C. Z., no. 6, pl. 2, f. 8, 9.

110 specimens, including 60 COTYPES. Off South Carolina, 229 fms. Florida: OFF CARYSFORT REEF, 117–320 fms.; OFF KEY WEST, 120–135 fms.; OFF BOCA GRANDE, 122–125 fms.; OFF SAND KEY, 125–270 fms.; OFF BAHIA HONDA KEY, 128 fms.; SOUTH OF MARQUESAS, 132 fms.; OFF THE TORTUGAS; OFF CONCH REEF, 117–169 fms. Bahamas: OFF DOUBLE-HEADED-SHOT KEYS, 123 fms. Cuba: Havana, off Morro Castle, 250–400 fms. Off Martinique, 476 fms. Off St. Vincent, 124 fms.

Species of Ophiothamnus not represented in the M. C. Z.

350. O. AFFINIS LJUNGMAN, 1871. Öfv. Kongl. vet.-akad. Förh., **28**, p. 622. Off Portugal, 790 fms.

351. O. GRACILIS STUDER, 1882. Abh. K.-Preus. akad. wiss. Berlin, p. 24, pl. 3, f. 11a–e. West Australia; north of Dampier Archipelago, 50 fms.

352. O. LAEVIS LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 180, pl. 19, f. 1–4. Galapagos Islands, 551 fms.

353. O. MINIMUS (KOEHLER), 1906. Mem. Soc. zool. France, **19**, p. 26, pl. 2, f. 31, 32 (*Ophiolela*). Off northwestern Spain, 681 fms. Off Portugal, 751 fms.[1]

354. O. OCCLUSUS (KOEHLER), 1907. Bull. 99 Inst. océan., p. 44. 1909. Princesse-Alice Echinod., pl. 38, f. 5, 6 (*Ophioplinthaca*). Off the Madeira Islands, 792 fms.

355. O. STULTUS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 141, pl. 25, f. 9, 10; pl. 26, f. 1. Celebes, Moluccas, and Southwest Islands, 430–643 fms.

OPHIOMITRELLA.

VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 39.

Type-species: *Ophiacantha laevipellis* LYMAN, 1883. Bull. M. C. Z., **10**, p. 259. Monotypic when established.

356. O. LAEVIPELLIS (LYMAN).

Ophiacantha laevipellis LYMAN, 1883. Bull. M. C. Z., **10**, p. 259, pl. 6, f. 82–84.
Ophiomitrella laevipellis VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 39.

59 specimens, including HOLOTYPE and 51 PARATYPES. Off Martinique, 96 fms. (dubious). OFF ST. VINCENT, 88 fms. ST. VINCENT: off Milligan's Key, 124 fms.

357. O. MONILIFORMIS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 136, pl. 27, f. 2–4.

2 COTYPES. Dutch East Indies: NORTHEAST OF LUCIPARA ISLANDS, 1162 fms.

[1] The data with reference to the date, place and depth of the collection of this species, given under the species head in the final Travailleur et Talisman Report, p. 293, do not agree with the data given in the tables, p. 308–311. I have assumed that the latter are correct. The same inconsistency unfortunately occurs in a few other cases.

Species of Ophiomitrella not represented in the M. C. Z.

358. O. GLABRA (H. L. CLARK), 1901. Bull. U. S. F. C., **2**, p. 249, pl. 15, f. 1–4 (*Ophialcaea*). Porto Rico: Playa de Ponce.

OPHIOMITRA.

LYMAN, 1869. Bull. M. C. Z., **1**, p. 325.

Type-species: *Ophiomitra valida* LYMAN, 1869. *loc. cit.* Type designated by VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 57.

359. O. VALIDA LYMAN, 1869. Bull. M. C. Z., **1**, p. 325. 1871. Illus. cat. M. C. Z., no. 6, pl. 2, f. 4–6.

200 specimens, including HOLOTYPE and 1 PARATYPE. Florida: OFF SAND KEY, 120–130 fms. Cuba: off Havana, 175–242 fms.; off Santiago, 288 fms. Off Montserrat, 88–120 fms. Off Guadeloupe, 183 fms. Off Martinique, 169 fms. Off St. Lucia, 151–154 fms. Off St. Vincent, 75–124 fms. Off the Grenadines, 163–338 fms. Off Barbados, 73–237 fms.

Species of Ophiomitra not represented in the M. C. Z.

360. O. ORNATA VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 58, pl. 5, f. 1, 1a. Cuba: off Havana, 110–200 fms.

361. O. SPINEA VERRILL, 1885. Amer. journ. sci., ser. 3, **29**, p. 153. Off Marthas Vineyard, 1362 fms.[1]

OPHIOPLINTHACA.

VERRILL, 1899. Trans. Conn. acad., **10**, p. 351.

Type-species: *Ophiomitra dipsacos* LYMAN, 1878. Bull. M. C. Z., **5**, p. 155. Type designated.

362. O. CARDIOMORPHA (H. L. CLARK).
Ophiomitra cardiomorpha H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 179, f. 81.

2 PARATYPES. Japan: OFF KAGOSHIMA GULF, 440 fms.

363. O. CARDUUS (LYMAN).
Ophiomitra carduus LYMAN, 1878. Bull. M. C. Z., **5**, p. 154, pl. 9, f. 236–238.
Ophioplinthaca carduus VERRILL, 1899. Trans. Conn. acad., **10**, p. 351.

1 COTYPE. SOUTHWEST OF THE CANARY ISLANDS, 1675 fms.

[1] Verrill says, both in the paper here referred to and in his paper in the Report of the Fish Commissioner for 1883, that the specimens were taken at Station 2035 and the depth was 2038 fms. The Albatross records, however, show that the depth at Station 2035 is 1362 fms. At Station 2038, the depth is 2033 fms. Possibly this is the Station where the specimens of *spinea* were taken.

364. O. CHELYS (Wyville Thomson).
Ophiacantha chelys Wyville Thomson, 1877. The Atlantic, **2**, p. 64, f. 16, 17.
Ophioplinthaca chelys Verrill, 1899. Trans. Conn. acad., **10**, p. 352.

1 specimen, (cotype ?). Southwest of the Canary Islands, 1525 fms.

365. O. DISCYCLA (H. L. Clark).
Ophiomitra discycla H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 181, f. 82.

1 paratype. Japan: Bungo Channel, 437 fms.

366. O. GRANIFERA (Lütken and Mortensen).
Ophiomitra granifera Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 177, pl. 19, f. 9–12.

2 cotypes. Mexico: near Las Tres Marias Islands, 676 fms.

367. O. INCISA (Lyman).
Ophiomitra incisa Lyman, 1883. Bull. M. C. Z., **10**, p. 263, pl. 6, f. 89, 90.
Ophioplinthaca incisa Verrill, 1899. Trans. Conn. acad., **10**, p. 351.

66 specimens, including holotype and 57 paratypes. Cuba: off Havana, 480–860 fms. Between St. Thomas and St. Cruz, 580 fms. Off Dominica, 372–608 fms. Off Martinique, 334–476 fms. Off St. Lucia, 422 fms. Off St. Vincent, 573 fms. Off Grenada, 461 fms. Off Barbados, 399 fms.

368. O. MICROPHYLAX (H. L. Clark).
Ophiomitra microphylax H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 184, f. 84.

9 paratypes. Japan: off Kagoshima Gulf, 152 fms.; Southwest of Goto Islands, 139 fms.

369. O. MITIS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 127, pl. 25, f. 1–3.

1 cotype. Kei Islands: south of Kur, 114 fms.

370. O. PLICATA (Lyman).
Ophiomitra plicata Lyman, 1878. Bull. M. C. Z., **5**, p. 150, pl. 8, f. 209–212; pl. 9, f. 233–235.
Ophiolinthaca plicata Verrill, 1899. Trans. Conn. acad., **10**, p. 351.

1 cotype. Near Kermadec Islands, 630 fms.

371. O. POLYACANTHA (H. L. Clark).
Ophiomitra polyacantha H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 187, f. 86.

1 paratype. Japan: off Kagoshima Gulf, 103 fms.

372. O. PULCHRA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 125, pl. 27, f. 5–8.

1 cotype. Dutch East Indies: east of Rotti, 289 fms.

373. O. RUDIS (Koehler).
Ophiomitra rudis Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 358, pl. 9, f. 75–76.
Ophioplinthaca rudis Koehler, 1904. Siboga-exp. Oph. mer prof., p. 132.

1 specimen. Dutch East Indies: north of Sumbawa, 441 fms.

374. O. SARSII (LYMAN).
Ophiomitra sarsii LYMAN, 1878. Bull. M. C. Z., **5**, p. 151, pl. 8, f. 216, 217.
Ophioplinthaca sarsii VERRILL, 1899. Trans. Conn. acad., **10**, p. 352.

1 COTYPE. Near Marion Island, 1375 fms.

Species of Ophioplinthaca not represented in the M. C. Z.

375. O. BYTHIASPIS (H. L. CLARK), 1911. Bull. 75 U. S. N. M., p. 185, f. 85 (*Ophiomitra*). Off eastern Japan, 943 fms.

376. O. CITATA KOEHLER, 1904. Siboga-exp. Oph. mer Prof., p. 130, pl. 24, f. 5–7. Dutch East Indies: off Waigeu, 260 fms.; near Kei Islands, 114 fms.

377. O. CODONOMORPHA (H. L. CLARK), 1911. Bull. 75 U. S. N. M., p. 188, f. 87 (*Ophiomitra*). Off eastern Japan, 943 fms.

378. O. CORDIFERA (KOEHLER), 1896. Mem. Soc. zool. France, **9**, p. 250 (*Ophiomitra*). 1909. Princesse-Alice Echinod., pl. 29, f. 1–2 (*Ophiomitrella*). Vicinity of the Azores, 634 fms. Canary Islands, 740–745 fms.

379. O. DIPSACOS (LYMAN), 1878. Bull. M. C. Z., **5**, p. 155, pl. 8, f. 213–215 (*Ophiomitra*). Near Danish West Indies, 390 fms.

380. O. INTEGRA (KOEHLER), 1897. Ann. sci. nat. Zool., scr. 8, **4**, p. 356, pl. 9, f. 76, 77 (*Ophiomitra*). Andaman Islands, 220–240 fms.

381. O. MIRANDA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 123, pl. 31, f. 1, 2. Dutch East Indies: near Kei Islands 547 fms.

382. O. PARTITA (LÜTKEN and MORTENSEN), 1899. Mem. M. C. Z., **23**, p. 179, pl. 19, f. 5–8 (*Ophiomitra*). Mexico: near Las Tres Marias Islands, 676 fms.

383. O. SPINISSIMA H. L. CLARK, 1901. Bull. U. S. F. C., **2**, p. 250, pl. 15, f. 9–12. Porto Rico: Mayaguez Harbor, 97–120 fms.

384. O. VICINA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 129, pl. 25, f. 4–6. Dutch East Indies: Banda Sea, 886 fms.

OPHIOCAMAX.

LYMAN, 1878. Bull. M. C. Z., **5**, p. 136, 156.

Type-species: *Ophiocamax vitrea* LYMAN, 1878. *op. cit.*, p. 156. Monotypic when established.

385. O. FASCICULATA LYMAN, 1883. Bull. M. C. Z., **10**, p. 265, pl. 7, f. 92–94.

HOLOTYPE and 18 PARATYPES. OFF ST. KITTS, 208–270 fms. OFF MARTINIQUE, 189 fms. OFF BARBADOS, 180 fms.

386. O. HYSTRIX LYMAN, 1878. Bull. M. C. Z., **5**, p. 232, pl. 1, f. 13–15.

283 specimens, including HOLOTYPE and 6 PARATYPES. Cuba: OFF HAVANA, 175 fms.; off Santiago, 288 fms. Off St. Cruz, D. W. I., 248 fms. Off St. Kitts, 208 fms. Off Montserrat, 120–148 fms. Off Martinique, 189 fms. Off St. Vincent, 95–174 fms. Off Cannouan, 127 fms. Off Carriacou, 163 fms. Off Barbados, 180–221 fms.

387. O. PLESIOTAXIS, sp. nov. (πλησίος, near, close + τάξις, row, series). Plate 3, f. 9, 10.

Disk, 16 mm. in diameter; arms all broken, but probably about 120 mm. long. Disk covered by radial shields and scales; the largest of the latter are at the outer corners of the radial shields; about 25 of the scales carry prickly, cylindrical, spinelets; along the margins of nearly all scales and even between and at outer margin of radial shields are numerous, very small rough, conical spinelets or pointed granules. Radial shields large, bare, smooth, and closely joined. Upper arm-plates slightly swollen, rough, with minute, sharp granules, broader than long, with a gentle curve distally and a deep curve proximally; all well-separated from each other. Interbrachial spaces below covered with scales and scattered, rough conical spinelets or granules. Oral shields very small, warty, and rough. Adoral plates relatively very large, somewhat pentagonal. Both oral shields and adoral plates bear more or fewer rough spinules, much like the oral papillae but more thorny; these spinules tend to form a cluster at the inner point of the oral shield, where the adoral plates meet. Oral papillae and tooth-papillae very numerous, spiniform, little if at all flattened; they nearly conceal the oral plates. First under arm-plate small and difficult to make out; succeeding plates wider than long and rapidly becoming three times as wide as long; median distal portion swollen and very rough; lateral portions also quite rough. Side arm-plates large, meeting broadly below and less broadly above; each carries a series of 9–10 minutely roughened spines, of which the second or third (from above) is longest and rather exceeds two joints, while the two lowest are very small and rough; the series are closely approximated on the first two joints beyond disk (hence the name). Tentacle-scales on first arm-pores, 3–4, very big, flat, and conspicuous; the free end is very broad, wider than one half the length of the scale; succeeding scales gradually becoming smaller, fewer, and rougher; at middle of arm there is only a single scale at each pore and it is very minute and rough; the pore itself is exceedingly hard to make out. Color, pale wood-brown.

Holotype (M. C. Z. 3543). Andaman Islands, 220–240 fms. Investigator collection.

This specimen is one of those identified by Koehler (1897, Ann. sci. nat. Zool., ser. 8, 4, p. 360) as *fasciculata*, but in my opinion, it is not that species. I have compared it with typical specimens of *fasciculata*, *hystrix*, *polyploca*, *rugosa*, and *vitrea*, and it seems nearest the last. It differs from all the West Indian species in the approximation of the basal series of arm-spines. It is different from *fasciculata* further in the roughness of the disk-spinules, in the

shape and roughness of the upper and under arm-plates and in the shape of the oral papillae. It differs from *vitrea* in the disk-covering, in the much less thorny arm-spines and in the shape and roughness of the upper and under arm-plates.

388. O. POLYPLOCA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 193, f. 90.

7 paratypes. Japan: off Kagoshima Gulf, 103–152 fms.

389. O. RUGOSA Koehler, 1904. Siboga-Exp. Oph. mer prof., p. 139, pl. 26, f. 4–7.

1 cotype. Dutch East Indies: off southwest end of Timor, 217 fms.

390. O. VITREA Lyman, 1878. Bull. M. C. Z., **5**, p. 156, pl. 8, f. 218–221.

3 specimens, including 1 cotype. Off Admiralty Islands, 150 fms. Philippines: off Cebu, 95–100 fms.

Species of Ophiocamax not represented in the M. C. Z.

391. O. AUSTERA Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 60, pl. 6, 7, f. 2. Cuba: off Havana, 110 fms.

392. O. DOMINANS Koehler, 1906. Mem. Soc. zool. France, **19**, p. 21, pl. 1, f. 15, 16. South of the Canary Islands, 490 fms.

393. O. GIGAS Koehler, 1900. Bull. Acad. Belgique, p. 820. 1901. Belgica Ech. et Oph., pl. 2, f. 13–15. West Antarctica, 165–195 fms.

394. O. LITHOSORA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 191, f. 89. Eastern Sea, 361 fms.

Ophiacanthella.

Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 39.

Type-species: *Ophiacantha troscheli* Lyman, 1878. Bull. M. C. Z., **5**, p. 142. Monotypic.

395. O. TROSCHELI (Lyman).
Ophiacantha troscheli Lyman, 1878. Bull. M. C. Z., **5**, p. 142, pl. 9, f. 222–224.
Ophiacanthella troscheli Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 39.

4 specimens. Off St. Vincent, 124 fms. Off Barbados, 73 fms.

Ophioprium, gen. nov.

Type-species: *Ophiacantha cervicornis* Lyman, 1883. Bull. M. C. Z., **10**, p. 257.

Verrill, (1899, Bull. Univ. Iowa, new ser., **1**, no. 6) established the genus Ophiopristis for this species, and several others (p. 40) but he definitely desig-

nates *Ophiacantha hirsuta* (p. 44) as the type-species. I am not satisfied that *hirsuta* is generically different from Ophiacantha but *cervicornis* certainly is, and I do not think these two species should be placed in the same genus. I am therefore obliged to relegate Ophiopristis, for the present at least, to the list of synonyms of Ophiacantha, while *cervicornis* has to become the type of a new genus, characterized by concealed radial shields, large tentacle-pores guarded by two or more tentacle-scales (at least on basal arm-joints) of which one is attached to the under arm-plate, and numerous oral papillae confluent with the long and slender spinelets which guard the oral tentacle-pore. Of the four species included in the genus only two are strictly congeneric, *cervicorne* and *permixtum;* they are strikingly alike and may possibly be identical. The species here first described as *imperfectum* may not belong in Ophioprium and the same is true of the Australian species, *axiologum*, but for the present, while lacking adequate material, a loose definition of the genus will give them a temporary resting-place.

396. O. CERVICORNE (LYMAN).
Ophiacantha cervicornis LYMAN, 1883. Bull. M. C. Z., **10**, p. 257, pl. 5, f. 76–78.

HOLOTYPE. OFF ST. VINCENT, 573 fms.

397. O. IMPERFECTUM, sp. nov. Plate **3**, f. 7, 8.

Disk missing; approximately 5 mm. in diameter; arms 20–25 mm. long. Upper arms-plates triangular, the base (distal margin) broadly curved, about as wide as long, separated from each other. Oral shields large, triangular, wider than long; distal margin nearly straight. Adoral plates not distinguishable, but necessarily very narrow. Oral papillae small, pointed, 3 or 4 on each side, the series confluent with 3 or 4 distinctly larger and flatter papillae protecting the oral tentacle-pore. Under arm-plates long and narrow, the ends convexly curved, the sides markedly concave, separated from each other. Side arm-plates not prominent but meeting both above and below; each plate carries 4 or 5 flattened, pointed, smooth, opaque but hollow spines, the uppermost somewhat the longest but the others not markedly shorter. Tentacle-scales, 3 (on basal joints), narrow and pointed; one of them is attached to the under arm-plate. Color, dirty whitish.

HOLOTYPE (M. C. Z. 2167). OFF ST. VINCENT, 424 fms. Blake Station 226.

This specimen is labeled by Mr. Lyman: "Ophioscolex? Ophiolebes? 2–3 spiniform tentacle scales. Thin upper arm plates. Soft disk-skin. 4 flat,

hollow arm-spines, upper longest." Evidently he regarded its position as very uncertain and put it aside, hoping for more material. It seems desirable to give a name to it and publish such information about it as is available. But the condition of the specimen and the state of our knowledge of its relationships suggest the name given.

Species of Ophioprium not represented in the M. C. Z.

398. O. AXIOLOGUM (H. L. CLARK), 1909. Mem. Austr. mus., **4**, p. 543, pl. 53, f. 1–3 (*Ophiopristis*). New South Wales: off Wata Mooli, 54–59 fms.

399. O. PERMIXTUM (KOEHLER), 1914. Bull. 84 U. S. N. M., p. 96, pl. 11, f. 3, 4 (*Ophiacantha*). North of the Bahamas, 338 fms.

OPHIOTRETA.

VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 40, 44.

Type-species: *Ophiacantha lineolata* LYMAN, 1883. Bull. M. C. Z., **10**, p. 258. Type designated.

400. O. EXIMIA (KOEHLER).
Ophiacantha eximia KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 116, pl. 21, f. 3–5.

1 COTYPE. Dutch East Indies: NORTH OF SUMBAWA, 442 fms.

401. O. LINEOLATA (LYMAN).
Ophiacantha lineolata LYMAN, 1883. Bull. M. C. Z., **10**, p. 258, pl. 6, f. 79–81.

HOLOTYPE. OFF ST. KITTS, 208 fms.

402. O. MIXTA (LYMAN).
Ophiochaeta (?) mixta LYMAN, 1878. Bull. M. C. Z., **5**, p. 222, pl. 2, f. 40–42.

14 specimens, including HOLOTYPE and 8 PARATYPES. Cuba: OFF HAVANA, 160–242 fms. Off St. Vincent, 75–124 fms.; off Grenada, 262–576 fms.

403. O. SERTATA (LYMAN).
Ophiomitra sertata LYMAN, 1869. Bull. M. C. Z., **1**, p. 326. KOEHLER, 1907. Bull. sci., **41**, pl. 12, f. 32, 33.

14 specimens, including HOLOTYPE. Bahamas: OFF DOUBLE-HEADED-SHOT KEY, 315 fms. Cuba: off Havana, 175 fms. Off St. Kitts, 208 fms. Off Martinique, 213 fms. Off Carriacou, 163 fms. Off Grenada, 262 fms. Off Barbados, 200–221 fms.

Species of Ophiotreta not represented in the M. C. Z.

404. O. DILECTA (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 117, pl. 22, f. 3, 4 (*Ophiacantha*). Dutch East Indies: Celebes, off Dongala, 402 fms.; north of Sumbawa, 442 fms.

405. O. LITTORALIS (KOEHLER), 1913. Zool. jahrb. Suppl. **11**, p. 370, pl. 21, f. 1–3 (*Ophiolimna*). Danish West Indies: St. Thomas.

Ophialcaea.

Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 38, 42.

Type-species: *Ophiacantha tuberculosa* Lyman, 1878. Bull. M. C. Z., **5**, p. 137. Type here first designated.

406. O. TUBERCULOSA (Lyman).
Ophiacantha tuberculosa Lyman, 1878. Bull. M. C. Z., **5**, p. 137, pl. 8, f. 204–205.
Ophialcaea tuberculosa Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 42.

1 specimen, probably a cotype. Philippine Islands: Sea of Cebu, 375 fms.

Species of Ophialcaea not represented in the M. C. Z.

407. O. CONGESTA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 103, pl. 24, f. 1, 2 (*Ophiacantha*). Dutch East Indies: Celebes, off Macassar, 250 fms.; off Salawatti, 444 fms.

408. O. NUTTINGII Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 46, pl. 8, f. 1, 1a. Cuba: off Havana, 200 fms.

Ophientrema.

Verrill, 1899. Trans. Conn. acad., **10**, p. 332.

Type-species: *Ophiacantha scolopendrica* Lyman, 1883. Bull. M. C. Z., **10**, p. 259. Type designated.

409. O. LEUCOSTICTUM (H. L. Clark).
Ophiacantha leucosticta H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 235, f. 111.

1 paratype. Off southeastern Japan, 507 fms.

Species of Ophientrema not represented in the M. C. Z.

410. O. SCOLOPENDRICUM (Lyman), 1883. Bull. M. C. Z., **10**, p. 259, pl. 6, f. 85–87 (*Ophiacantha*). Japan: off east coast, 565 fms.

Ophiotoma.

Lyman, 1883. Bull. M. C. Z., **10**, p. 268.

Type-species: *Ophiotoma coriacea* Lyman, 1883. *loc. cit.* = *Ophiacantha bartletti* Lyman, 1883. *op. cit.*, p. 256. Monotypic when established.

411. O. BARTLETTI (Lyman).
Ophicantha bartletti Lyman, 1883. Bull. M. C. Z., **10**, p. 256, pl. 5, f. 73–75.

4 specimens, including holotype, and holotype of *Ophiotoma coriacea* Lyman. East of Cape Cod, 1242 fms. Off St. Vincent, 573 fms. Off Grenada, 291 fms.

412. O. MEGATRETA (H. L. Clark).
Ophiacantha megatreta H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 237, f. 113.

1 PARATYPE. Off southeastern Japan, 943 fms.

413. O. PAUCISPINA (Lütken and Mortensen).
Ophiacantha paucispina Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 175, pl. 18, f. 1–4.

1 COTYPE. East of Cocos Island, 1175 fms.

Species of Ophiotoma not represented in the M. C. Z.

414. O. ALBERTI (Koehler), 1896. Mem. Soc. zool. France, **9**, p. 251. 1909. Princesse-Alice Echinod., pl. 28, f. 1, 2 (*Ophiotrema*). East of the Azores, 2234 fms.

415. O. ASSIMILIS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 144, pl. 28, f. 1, 2. Dutch East Indies: off Ceram, 315 fms.; off Rotti, 510 fms.

Ophioconis.

Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 32, 88, 98.

Type-species: *Pectinura forbesi* Heller, 1862. Sitzb. Kongl.-akad. wien, **46**, p. 422. Type designated.

416. O. ANTARCTICA Lyman, 1879. Bull. M. C. Z., **6**, p. 44, pl. 14, f. 380–382.

6 COTYPES. Near Heard Island, 150 fms. Off Marion Island, 50–75 fms.

417. O. DIASTATA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 27, f. 3.

1 PARATYPE. Japan: off Shio Misaki Light, 253 fms.

418. O. MILIARIA Lyman, 1878. Bull. M. C. Z., **5**, p. 221, pl. 3, f. 49–51.

6 specimens, including HOLOTYPE. Cuba: off Havana, 243–450 fms. On Saba Bank, 21 fms. Off St. Lucia, 422 fms. Off Carriacou, 163 fms. Off Grenada, 291 fms.

419. O. MONOLEPIS (Matsumoto).
Ophiuroconis monolepis Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 85.

2 COTYPES. Japan: Sagami Sea, 85 fms.

420. O. PAPILLATA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 28, f. 4.

5 PARATYPES. Bering Sea, 350 fms. Off Aleutian Islands, 72 fms.

Species of Ophioconis not represented in the M. C. Z.

421. O. BREVISPINA Ludwig, 1880. Mitth. Zool. stat. Neapel, **2**, p. 61, pl. 4, f. 3a, 3b. Naples.

422. O. CINCTA Brock, 1888. Zeits. f. wiss. zool., **47**, p. 480. Koehler, 1905. Siboga-exp. Oph. litt., pl. 2, f. 2, 3. Amboina.

423. O. CUPIDA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 15, pl. 1, f. 19, 20. Dutch East Indies: Moluccas, 25 fms. Sulu Archipelago, 7–13 fms.

424. O. FORBESI (HELLER), 1862. Sitzb. Kongl.-akad. Wien, **46**, p. 422, pl. 2, f. 5–8 (*Pectinura*). Adriatic Sea, 15–50 fms.

425. O. GRANDISQUAMA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 11, pl. 2, f. 11, 12. Dutch East Indies: west of Waigeu, 261 fms.

426. O. INDICA KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 325, pl. 7, f. 38, 39. Andaman Islands, 45–270 fms.

427. O. PERMIXTA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 14, pl. 2, f. 4, 7.[1] Dutch East Indies: southeast of Celebes, 42–53 fms.; near Kei Islands, 50 fms.

428. O. PULVERULENTA LYMAN, 1879. Bull. M. C. Z., **6**, p. 45, pl. 14, f. 377–379. Near Tonga Islands, 240 fms.

OPHIOCORMUS [2] gen. nov.

Type-species: *Ophiocormus notabilis*, sp. nov.

Disk, interbrachial spaces below to tips of jaws, upper and lower surfaces of basal arm-joints, and even portions of the basal side arm-plates covered with minute rough, stumpy granules (hence the name). Radial shields, oral shields and adoral plates, basal upper arm-plates and a few basal under arm-plates completely concealed. Oral papillae numerous. Arm-spines few and very short.

The real relationships of this remarkable genus are uncertain. It is quite possible that its true position is in the Ophiodermatidae, but the oral papillae and the granules covering the body surface are so ophiacanthine that it may be wisely placed in the present family. Moreover the arm-spines, though so minute, seem to be hollow and their appearance under the microscope is much more like those of Ophioconis than like any ophiodermatid spines examined. On the whole I regard Ophiocormus as an extreme development from an Ophioconis-like ancestor but of course more abundant material is necessary before the matter can be satisfactorily determined.

429. O. NOTABILIS, sp. nov. Plate **3**, f. 11, 12.

Disk, 3 mm. in diameter; arms 6 mm. long, distinctly flattened, especially near tip, and rather wide. Disk, upper surface of seven basal arm-joints, interbrachial spaces below to tips of jaws, and lower surface of three basal arm-joints covered with a coat of rough granules, not crowded but uniformly spaced, except on the arm-surfaces where they become more and more scattered and completely

[1] Figures 5 and 7 on pl. **2**, Siboga littoral ophiurans have exchanged their numbers; hence all text references are wrong.

[2] *ὄφις*, snake + *κορμός*, trunk, log, stump.

disappear distally. Near the margin of the disk and over the distal end of the concealed radial shields some of the granules are enlarged to several times the usual height, but they are still too minute to call spinelets. Upper arm-plates, where visible, small, rounded triangular, widely separated. Oral shield and adoral plates concealed. Oral papillae about 10 on each side; the two or three distalmost are oval and flat, and much larger than the others which are narrow, bluntly pointed and somewhat flattened; all are more or less rough. Genital slits small, bordered by a series of rough granules noticeably larger than the others on the interbrachial space. Beyond the third arm-joint, the under arm-plates become visible, although granules continue to the middle of the arm; the plates are longer than wide, separated from each other, with a distal notch, concave sides and proximal margin pointed. Side arm-plates meeting above and below; each carries a series of five small, pointed conical spines, apparently hollow, of which the uppermost is a trifle longer than the others and nearly equals the arm-joint; besides the arm-spines, the side arm-plates near base of arm have more or fewer of the rough granules on their free surfaces. Tentacle-scale single, very large, flat, oval, pointed. Color (dried from alcohol), dirty yellowish.

HOLOTYPE (M. C. Z. 3795). New Zealand: NEAR WELLINGTON. August, 1913. H. Farquhar.

In presenting this unique specimen to the M. C. Z., and allowing me to describe it Mr. Farquhar showed his characteristically generous spirit. He stated that he collected it under a stone near low-water mark near Wellington and had never seen another.

OPHIOMYCES.

LYMAN, 1869. Bull. M. C. Z., **1**, p. 343.

Type-species: *Ophiomyces frutectosus* LYMAN, 1869. *op. cit.*, p. 345. Type here first designated.

430. O. FRUTECTOSUS LYMAN, 1869. Bull. M. C. Z., **1**, p. 345. 1871. Illus. cat. M. C. Z., no. 6, pl. 2. f. 11–13.

16 specimens, including HOLOTYPE and 3 PARATYPES. North Atlantic: off Portugal, Josephine Bank, 117–130 fms. Florida[1]: off west coast, 100 fms.; off Alligator Reef, 110–113 fms.; OFF TENNESSEE REEF, 160 fms.; OFF CONCH REEF, 77 fms.; OFF SAND KEY, 100 fms. Cuba: off Havana, 119 fms. Off Barbados, 100–288 fms.

[1] Without definite locality.

431. O. GRANDIS Lyman, 1879. Bull. M. C. Z., **6**, p. 46, pl. 14, f. 383–385.

1 cotype. Off Tristan d' Acunha, 1000 fms.

432. O. MIRABILIS Lyman, 1869. Bull. M. C. Z., **1**, p. 343. Koehler, 1914. Bull. 84 U. S. N. M., pl. 3, f. 6.

8 specimens, including holotype and 2 paratypes. Florida; off Sand Key, 237–306 fms.; off Marquesas Key, 296 fms.; off Carysfort Reef, 320 fms. Off St. Lucia, 422 fms.

433. O. SPATHIFER Lyman, 1879. Bull. M. C. Z., **6**, p. 47, pl. 14, f. 386–388a.

1 cotype. Off southern Japan, 565 fms.

Species of Ophiomyces not represented in the M. C. Z.

434. O. DELATA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 100, pl. 18, f. 1, 2. Sulu Archipelago, 195–298 fms. Dutch East Indies: off Ceram, 2355 fms.

Ophiotholia.

Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 4.

Type-species: *Ophiotholia supplicans* Lyman, 1880. *loc. cit.* Monotypic when established.

435. O. MITREPHORA H. L. Clark, 1910. Proc. U. S. N. M., **37**, p. 665, f. 1, 2.

1 paratype. East of the Danish West Indies, 496 fms.

Species of Ophiotholia not represented in the M. C. Z.

436. O. MULTISPINA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 99, pl. 33, f. 4, 5. Dutch East Indies: Molucca Passage, 228–263 fms.; off Ceram, 315 fms.; Banda Sea, 263 fms.; off Rotti, 120 fms.

437. O. SUPPLICANS Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 4, pl. 1, f. 1–3. Southwest of Juan Fernandez, 1825 fms.

Ophiohelus.

Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 5.

Type-species: *Ophiohelus umbella* Lyman, 1880. *loc. cit.* Type here first designated.

438. O. UMBELLA Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 5, pl. 1, f. 4–10, 16.

Holotype and 2 paratypes. Off Barbados, 82 fms.

Species of Ophiohelus not represented in the M. C. Z.

439. O. PELLUCIDUS Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 6, pl. 1, f. 11–15. Near Fiji Islands, 1350 fms.

Microphiura.

Mortensen, 1910. Vid. med., p. 204.

Type-species: *Microphiura decipiens* Mortensen, 1910. *loc. cit.* Monotypic.

440. M. DECIPIENS Mortensen, 1910. Vid. med., p. 204, f. 1, 2, pl. 2, f. 1–10.

2 cotypes. St. Cruz, D. W. I., off Fredericksstadt, 500 fms., (*circa*).

Genera of Ophiacanthidae not represented in the M. C. Z.

Ophiomedea Koehler, 1906. Mem. Soc. zool. France, **19**, p. 19.

441. Type-species: OPHIOMEDEA DUPLICATA Koehler, 1906. *op. cit.*, p. 20, pl. 2, f. 20, 21. Monotypic. Canary Islands: north of Lanzarote, 1153 fms.

Ophiocopa Lyman, 1883. Bull. M. C. Z., **10**, p. 266.

442. Type-species: OPHIOCOPA SPATULA Lyman, 1883. *loc. cit.*, pl. 7, f. 95–98. Monotypic. Admiralty Islands, 150 fms.

Ophiodiplax Koehler, 1911. Brit. Ant. exp. rept. sci. invest. **2**, p. 48.

443. Type-species: OPHIODIPLAX DISJUNCTA Koehler, 1911. *loc. cit.*, pl. 6, f. 9–11. Monotypic. Antarctica: Victoria Land, Ross Island, Cape Royds, 60–80 fms.

Ophiochaeta Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 38, 89, 98.

444. Type-species: OPHIOCHAETA HIRSUTA Lütken, 1869. *op. cit.*, p. 38. Döderlein, 1896. Jena. denkschr., **8**, pl. 15, f. 4, 4a. Monotypic. Fiji Islands.

Ophioblenna Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 137.

445. Type-species: OPHIOBLENNA ANTILLENSIS Lütken, 1859. *loc. cit.*, pl. 4, f. 4a–4d. Monotypic. Danish West Indies: Water Island.

Ophiocymbium Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 7.

446. Type-species: OPHIOCYMBIUM CAVERNOSUM Lyman, 1880. *loc. cit.* 1882. Challenger Oph., pl. 27, f. 1–3. Monotypic. East of Kerguelen, 1950 fms.

Ophiambix Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 11.

447. Type-species: OPHIAMBIX ACULEATUS Lyman, 1880. *loc. cit.*, pl. 2, f. 29–31. Monotypic. Near Fiji Islands, 1350 fms.

OPHIOMYTIS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 142.

448. Type-species: OPHIOMYTIS WEBERI KOEHLER, 1904. *loc. cit.*, pl. 18, f. 3–5. Monotypic. Dutch East Indies: off Rotti, 289 fms.

OPHIOPHRURA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 249.

449. Type-species: OPHIOPHRURA LIODISCA H. L. CLARK, 1911. *loc. cit.*, f. 121. Monotypic. Japan: off Omai Saki Light, 475–505 fms.

OPHIOLOGIMUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 252.

450. Type-species: OPHIOLOGIMUS HEXACTIS H. L. CLARK, 1911. *loc. cit.*, f. 123. Monotypic when established. Japan: Hondo Island, off Suno Saki, 83–158 fms.

451. O. SECUNDUS KOEHLER, 1914. Bull. 84 U. S. N. M., p. 115, pl. 16, f. 4, 5. Off Georgia, 294 fms.

GNATHOPHIURIDA.

AMPHIURIDAE.

AMPHIURA.

FORBES, 1843. Trans. Linn. soc., **19**, p. 149.

Type-species: *Amphiura chiajii* FORBES, 1843. *op. cit.*, p. 151. Type designated by VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 24.

452. A. ACACIA LYMAN, 1879. Bull. M. C. Z., **6**, p. 21, pl. 11, f. 292–294.

1 COTYPE. OFF SOUTHERN JAPAN, 565 fms.

453. A. ANGULARIS LYMAN, 1879. Bull. M. C. Z., **6**, p. 25, pl. 11, f. 311–313.

5 COTYPES. NEAR HEARD ISLAND, 150 fms.

454. A. ANOMALA LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 15, pl. 3, f. 26–28.

20 COTYPES. OFF JUAN FERNANDEZ, 220 fms.

455. A. ANTARCTICA STUDER, 1876. Monatsb. K.-Preus. akad. wiss. Berlin, p. 461. Plate **4**, f. 1, 2.

5 specimens, including 1 COTYPE. KERGUELEN ISLAND: Whale Bay; Royal Sound, 28 fms.; Balfour Bay, 20–60 fms.

456. A. ARCYSTATA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 145, f. 58 (*acrystata* by typographical error).

24 specimens, including 14 paratypes. Off central California, 33 fms. California: San Francisco, west of Golden Gate, 30 fms. Japan: Hokkaido, off southern coast, 269–330 fms.; Hondo, off eastern coast, 110–259 fms.; Sagami Sea, 200 fms.

457. A. ARENARIA Farquhar, 1913. Trans. N. Z. inst., **45**, p. 214, f. 1, 2, and pl. 4.

8 cotypes. New Zealand: Porirua Harbor, near Wellington.

458. A. ASTER Farquhar, 1901. Trans. N. Z. inst., **33**, p. 250. Koehler, 1907. Bull. sci., **41**, pl. 11, f. 15, 16.

4 specimens. New Zealand: Timaru.

459. A. BELLIS Lyman, 1879. Bull. M. C. Z., **6**, p. 19, pl. 11, f. 282–284.

3 specimens, including 2 cotypes. Japan: off southern coast, 345 fms.; off eastern coast, 63–75 fms.

460. A. BOREALIS (G. O. Sars). Plate **4**, f. 3, 4.

Ophiopeltis borealis G. O. Sars, 1871. Vid.-selsk. Forh., f. 1871, p. 16.
Amphiura borealis Lyman, 1882. Challenger Oph., p. 124, 144.

1 specimen. Scandinavia. From Professor Sars; may be a cotype.

461. A. CAPENSIS Ljungman, 1867. Öfv. Kongl. vet.-akad. Förh., **23**, p. 320. Lyman, 1882. Challenger Oph., pl. 18, f. 14–16.

6 specimens, including 2 cotypes. Cape Colony: Cape of Good Hope; off Lee's Point, 98 fms.

462. A. CARCHARA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 142, f. 55.

20 specimens, including 19 paratypes. Off Alaskan Peninsula, 625–695 fms. Off Alaska, 1569 fms. Lower California: off Point San Tomas, 1090 fms.

463. A. CHIAJII Forbes, 1843. Trans. Linn. soc., **19**, p. 151. Lütken, 1858. Add. ad hist. Oph., pt. 1, pl. 2, f. 12a, 12b.

30 specimens. Norway. Sweden: Bohuslän. Scotland: Oban; the Minch.

464. A. CONCOLOR Lyman, 1879. Bull. M. C. Z., **6**, p. 27, pl. 12, f. 317–319.

13 specimens, including 5 cotypes. Japan: Uraga Channel, 340 fms. Near Aru Islands, 800 fms.

465. A. CONSTRICTA Lyman, 1879. Bull. M. C. Z., **6**, p. 22, pl. 11, f. 295–298.

1 specimen. Victoria: Westernport.

466. A. CORRECTA Koehler, 1907. Bull. sci., **41**, p. 300, pl. 12, f. 30, 31.

1 cotype. Loc.? Quoy and Gaimard coll.

467. A. DILATATA Lyman, 1879. Bull. M. C. Z., **6**, p. 26, pl. 11, f. 314–316.

3 cotypes. Cape of Good Hope, 98 fms.

468. A. DIOMEDEAE Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 151, pl. 12, f. 1–7.

28 specimens, including 9 cotypes. Gulf of Panama, 1020 fms. California: southwest of Santa Cruz Island, 640 fms. Japan: Suruga Gulf, 148–332 fms.; off eastern coast, 400–749 fms.

469. A. EUGENIAE Ljungman, 1867. Öfv. Kongl. vet.-akad. Förh., **23**, p. 318. Plate **4**, f. 9, 10.

5 specimens. Off northeastern and eastern Patagonia, 30–55 fms.

470. A. EUOPLA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 144, f. 57.

4 paratypes. Off eastern Japan, 45–60 fms.

471. A. FILIFORMIS (O. F. Müller).

Asterias filiformis O. F. Müller, 1776. Prod. zool. Dan., p. 235.
Amphiura filiformis Forbes, 1843. Trans. Linn. soc., **19**, p. 151. Lütken, 1858. Add. ad hist. Oph., pt. 1, pl. 2, f. 11a, 11b.

16 specimens. Norway. Sweden: Bohuslän.

472. A. GONIODES, sp. nov. (γωνιώδης, angular). Plate **4**, f. 7, 8.

Disk 4 mm. in diameter; arms 22 mm. long. Very similar to *A. angularis* (hence the name) but distinguishable by the smaller and sharper arm-spines and the much smaller oral papillae, especially the subdental pair. In *angularis* the arm-spines are rather thick and blunt and the oral papillae, particularly the subdental pair, are noticeably large. These details are well-shown in Lyman's Challenger Report, pl. **29**, f. 1–3.

Holotype (M. C. Z. 1369) and 1 paratype (M. C. Z. 1370). Off Barbados, 399 fms., Blake St. 288. Off Martinique, 476 fms., Blake St. 204.

These two specimens are listed by Lyman in the Blake Report (p. 253) as *Amphiura angularis* but on the labels the name is followed by a question mark and the holotype is accompanied by this note: "Seems not to be different from *angularis* except radial shields a little closer and disk scales less marked. Has stouter arm spines, and coarser disk scales and smaller radial shields than *A. semiermis*." I do not think the differences in the disk-scaling would justify separating these specimens from *angularis*, but the differences in the oral papillae

and arm-spines are more important. In view of the fact that *angularis* is an Antarctic species from the vicinity of Heard Island, it is important not to affirm its occurrence in the West Indies until we have better evidence than these two BLAKE specimens afford.

473. A. GRANDISQUAMA LYMAN, 1869. Bull. M. C. Z., **1**, p. 334. KOEHLER, 1898. Hirondelle Ech. et Oph., pl. 9, f. 45, 46 (as *A. longispina*).

22 specimens, including the HOLOTYPE. Off Georgia, 229–262 fms. Florida: OFF TENNESSEE REEF, 174 fms.; off Sombrero Key, 240 fms.; off Sand Key, 125–134 fms.; off the Tortugas, 262 fms. Gulf of Mexico, 152 fms.

474. A. GYMNOGASTRA LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 145, pl. 9, f. 6–8.

2 COTYPES. GULF OF PANAMA, 1270 fms.

475. A. GYMNOPORA LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 150, pl. 11, f. 7–9.

6 COTYPES. GULF OF PANAMA, 182 fms.

476. A. INCANA LYMAN, 1879. Bull. M. C. Z., **6**, p. 20, pl. 11, f. 285–287.

4 COTYPES. Cape Colony: SIMON'S BAY, 10–20 fms.

477. A. IRIS LYMAN, 1879. Bull. M. C. Z., **6**, p. 23, pl. 11, f. 302–304.

1 specimen. Dutch East Indies: near Lucipara Islands, 887 fms.

478. A. LEPTOPHOLIDA, sp. nov. (λεπτοφόλιδος, having fine scales). Plate **4**, f. 11, 12.

Disk 6 mm. in diameter; arms 20–25 mm. long. Disk covered with a coat of rather small, overlapping scales (hence the name) among which the primary plates are not distinguishable; from center to interradial margin, 15–17 series of scales may be counted and across each interradial areal (*i. e.* from proximal end of a radial shield to the proximal end of the nearer shield of the adjoining pair) 13–15 series. Radial shields small; length about one third of disk-radius and width about one third of length; proximally separate but distal ends in contact. Just distal to radial shields is a minute spinelet or little stumpy hook, borne on the distal end of the genital scale. Upper arm-plates broadly oval with distal margin nearly straight and proximal much curved; they are all more or less in contact. Interbrachial spaces below completely covered by crowded minute scales. Oral shields ovate, widest distal to middle, but with distal end narrower than proximal. Adoral plates almost triangular, the inner ends being very narrow and only slightly in contact. Subdental oral papillae rather small, ovate. At the distal end of the mouth-angles each adoral plate carries two oral

papillae; the inner (proximal) one is racquet-shaped, *i. e.* wide and oval at base but suddenly contracted into a slender blunt spine, its whole length being approximately equal to that of the oral plate; the outer or distal papilla is a mere, rounded scale, about equal to the basal part of its racquet-shaped fellow. First under arm-plate squarish, very small; succeeding plates more or less pentagonal, with a proximal angle, broader distally than proximally, about as wide as long, barely in contact with each other; each plate has an indistinct light spot on its proximal angle. Side arm-plates moderate; each carries a series of four (or more commonly three) slender, acute arm-spines, subequal or next to the uppermost smallest, the longest rather exceeding the arm-joint. Tentacle-scales two, the inner one very narrow and attached the whole of its length to the lateral margin of the under arm-plate. Color (dried from alcohol), very pale brownish.

HOLOTYPE (M. C. Z. 1365) and 1 PARATYPE (M. C. Z. 3924). Japan: MOUTH OF BAY OF YEDDO. E. S. Morse collection.

These specimens are accompanied by a sketch of the mouth parts and a label "Amphiura sp. nov.? B" in Mr. Lyman's hand. The species is very near *A. concolor* from near the Aru Islands but is readily distinguished by the characteristic oral papillae, and by the much finer disk-scaling. It is one of those forms which connect Amphiura and Amphiodia, having three oral papillae on each side of the jaw and yet obviously an Amphiura in a restricted sense.

479. A. LEPTOTATA, sp. nov. (λεπτότατος, most fine). Plate 5, f. 1, 2.

Disk 3.5 mm. in diameter; arms 30–35 mm. long, very slender. Very near *A. borealis* of the Norwegian coast, having the disk covered with a very fine coat of scales (hence the name), narrow and almost parallel radial shields, three or four small arm-spines and no tentacle-scales. The interbrachial spaces below are nearly naked except near the margin. The only distinguishing feature of importance which a direct comparison with specimens of *borealis* shows is in the shape of the middle (or next to the lowest of four) arm-spine; in *leptotata* this spine is very noticeably flattened and truncate, except at the very base and on the distal part of the arm; near the middle of the arm it is most conspicuous. Color (dried from alcohol), pale gray.

HOLOTYPE (M. C. Z. 1367). PHILIPPINE ISLANDS. Semper collection.

The close resemblance of this species to such a coldwater form as *borealis* is very remarkable. It is also near to *dilatata* from the Cape of Good Hope, but it is more readily distinguished from that species than from *borealis*.

480. A. LUNARIS Lyman, 1878. Bull. M. C. Z., **5**, p. 226, pl. 2, f. 31–33.

3 specimens, including HOLOTYPE and 1 PARATYPE. GULF OF MEXICO, 955 fms. Off St. Vincent, 424 fms.

481. A. LÜTKENI Duncan, 1879. Journ. Linn. soc. Zool., **14**, p. 464, pl. 10, f. 17.

2 specimens. Philippine Islands. Identity?

482. A. MAGELLANICA Ljungman, 1867. Öfv. Kongl. vet.-akad. Förh., **23**, p. 320. Koehler, 1908. Trans. Roy. soc. Edinburgh, **46**, pl. 11, f. 104.

12 specimens. Northeastern Patagonia, 30 fms. Patagonia: near Gulf Matias, from kelp.

483. A. MEDITERRANEA Lyman, 1882. Challenger Oph., p. 142. Plate **4**, f. 5, 6.

5 COTYPES. NAPLES. NICE.

484. A. MICROSOMA, sp. nov. (*μικρός*, small + *σῶμα*, body). Plate **5**, f. 5–7.

Disk 5 mm. in diameter; arms 50–55 mm. long; the body seems disproportionately small (hence the name). Upper surface of disk covered by a dark skin in which are imbedded numerous minute scales, which are largest and most easily visible about the radial shields. The latter are three times as long as wide but are scarcely half as long as radius of disk; the two of a pair are approximately parallel and separated altogether or barely in contact distally. Upper arm-plates, somewhat ellipsoidal, much wider than long (except the first 6–8), broadly in contact throughout. Interbrachial spaces below covered with a loose, soft skin, which, when dried, is seen to be full of minute scales. Genital slits moderate and inconspicuous. Oral shields, wider than long, diamond-shaped with somewhat rounded angles. Adoral plates small, not meeting proximal to oral shield but separating it from the side arm-plate. Oral papillae as in typical Amphiura, a thick squarish subdental pair and a pointed scale-like one on the inner end of the adoral plate; the latter is quite small and not easy to detect on all the adoral plates of the specimens in hand. First under arm-plate very small, barely separating the adjoining adoral plates; succeeding plates, squarish with rounded angles, in contact, longer than wide or length and breadth about equal. Side arm-plates not conspicuous and not meeting either above or below; each plate carries 5 (distally 4) blunt, arm-spines, of which the lowest is the stoutest, while the uppermost is somewhat less thick but is about as long; these two spines are about as long as an arm-joint while the intermediate three (or two) are a trifle smaller in every way. Tentacle-scale single, rounded, scale-like. Color in life:— radial shields whitish; naked skin of disk,

blackish; arms dull, faintly banded; dried specimens differ in having the arms lighter colored and very distinctly banded, distally, the whitish bands, 2–4 joints wide alternating with dull gray bands of about the same width; on the basal half of the arms the banding is much less distinct and the gray predominates.

HOLOTYPE (M. C. Z. 3736) and 1 PARATYPE (M. C. Z. 3925). Torres Strait: Murray Islands, MER. Oct. 7, 1913. Carnegie Exp., 1913. H. L. Clark coll.

This species is very much like Ophionephthys in the character of the disk but the arms are very Amphiura-like and it seems best, in view of our present imperfect knowledge of the former genus, to leave these Australian specimens in Amphiura. They were found in a piece of coral taken with the tangle in 4–5 fathoms of water off the west reef at Mer, and were kept alive at the laboratory for some hours. After dark it was noticed that they exhibited a remarkable degree of phosphorescence when irritated, a phenomenon not observed in any other ophiuran at Mer.

485. A. MULTISPINA, sp. nov. Plate 5, f. 3, 4.

Disk 8 mm. in diameter; arms 90–95 mm. long. Disk covered with rather coarse, but very numerous scales, largest about the radial shields and smallest at center of disk, where a central primary plate is noticeable; the other primary plates are not distinguishable. Radial shields small, less than 2 mm. long and much less than 1 mm. wide; they touch distally but are widely separated proximally. Upper arm-plates slightly ellipsoidal but seldom much wider than long, broadly in contact throughout. Interbrachial spaces below more or less bare but in one the close coat of scales extends half way to the oral shield. Genital slits small and inconspicuous. Oral shields oval rather longer than wide. Adoral plates very small, scarcely (or not) meeting within. Subdental oral papillae very large and close together; distal oral papilla, stout, blunt, erect, and conspicuous. First under arm-plate very small, scarcely separating the adjoining adorals; succeeding plates squarish with rounded corners, about as long as wide, broadly in contact. Side arm-plates small, not meeting either above or below; each one bears on either side a series of 7 or 8, rarely 9 (hence the name), short, blunt, thick, flattened arm-spines, subequal or the lowest a trifle the longest and about equalling an arm-joint. Tentacle-scale single, very large and conspicuous, nearly circular. Color (dried from alcohol), pale brown; disk more nearly gray.

HOLOTYPE (M. C. Z. 1360). Japan: MOUTH OF THE BAY OF YEDDO. E. S. Morse collection. 1878.

Mr. Lyman left with this specimen a sketch of the mouthparts and the notes "8–10 spines"; "Amphiura sp. nov.? A." It is a remarkably well-characterized species, owing to the large number of arm-spines and the conspicuous tentacle-scales.

486. A. OTTERI LJUNGMAN, 1871. Öfv. Kongl. vet.-akad. Förh., **28**, p. 631. KOEHLER, 1914. Bull. 84 U. S. N. M., pl. 8, f. 5–9.

19 specimens. Off the Azores, 900 fms. Off Cape Cod, 145–524 fms. Gulf of Mexico, 339 fms. Caribbean Sea, 228 fms. Off St. Cruz, D. W. I., 508 fms. Off Guadeloupe, 175–583 fms. Off Dominica, 333 fms. Off Martinique, 357 fms. Off St. Lucia, 116 fms. Off St. Vincent, 464 fms. Off Grenada, 576–792 fms. Several of these specimens are accompanied by notes from Mr. Lyman, indicating doubt as to the identification.

487. A. PALMERI LYMAN, 1882. Challenger Oph., p. 123, 143. 1875. Illus. cat. M. C. Z., no. 8, pt. 2, pl. 3, f. 35–37 (as *A. flexuosa* ? Ljn.).

6 specimens, including HOLOTYPE and 4 PARATYPES. Off Georgia, 262 fms. Florida: KEY BISCAYNE. OFF BARBADOS, 100 fms.

488. A. PARVA HUTTON, 1878. Trans. N. Z. inst., **11**, p. 305. Plate **5**, f. 10, 11.

2 specimens. New Zealand.

489. A. POECILA, sp. nov. (ποικιλος, many colored, pied). Plate **5**, f. 12, 13.

Disk 4 mm. in diameter; arms 16–20 mm. long. Disk covered with a coat of very numerous minute scales among which the six primary plates are conspicuous. Radial shields less than a millimeter long, and much less than half a millimeter wide, slightly divergent, separated their entire length. Upper arm-plates much wider than long; distal margin slightly, proximal margin very much, curved; more or less broadly in contact throughout. Interbrachial spaces below covered with a very fine scaling. Oral plates oval, a trifle longer than broad, widest distal to middle. Adoral plates rather large, meeting not only proximal to oral shield but in midradial line also. Oral papillae typical; subdental, moderately large, squarish, near together; distal, large, thick, spine-like and erect. First under arm-plate concealed by meeting of adoral plates in midradial line; succeeding plates squarish with rounded angles, slightly wider distally than proximally, about as long as wide, broadly in contact. Side arm-plates small, not meeting either above or below; bearing series of 5 or 6 (rarely 7) subequal, flattened, blunt spines, rather longer than an arm-joint. Tentacle-scales 2, the one on the side arm-plate larger; the one on the under arm-plate

decreases steadily in size and is wholly wanting on the distal part of the arm. Color (dried from alcohol):— disk, pale gray, the primary plates and radial shields somewhat darker; arms and oral surface of disk, pale cream-color or dirty whitish; upper arm-plates variegated with dull purple (hence the name).

HOLOTYPE (M. C. Z. 3548). Victoria: WESTERNPORT, 2–5 fms. J. Gabriel coll. 1911.

The coloration of the arms in this species is so unusual for an Amphiura that it attracts immediate attention; possibly it is even more striking in the living animal. The arm-spines and the adoral plates also furnish conspicuous diagnostic marks. This is only one of many interesting echinoderms which Mr. Gabriel has sent to the Museum, as a result of his enthusiastic interest in the marine fauna of Victoria.

490. A. ROSEA FARQUHAR, 1893. Trans. N. Z. inst., **26**, p. 110, pl. 9.

1 specimen. New Zealand: Foveaux Strait.

491. A. SARSI LJUNGMAN, 1871. Öfv. Kongl. vet.-akad. Förh., **28**, p. 630. Plate **5**, f. 8, 9.

1 COTYPE. Azores: OFF SAN MIGUEL, 320–600 fms.

492. A. SEMIERMIS LYMAN, 1869. Bull. M. C. Z., **1**, p. 332. 1875. Illus. cat. M. C. Z., no. 8, pt. 2, pl. 5, f. 64.

2 specimens. Gulf of Mexico, 539 fms. (Holotype missing).

493. A. SEPTEMSPINOSA, sp. nov. Plate **4**, f. 13, 14.

Disk 2 mm. in diameter; arms 8–10 mm. long. Disk covered by a coat of fine scales, among which the central plate is easily seen but the other primaries are scarcely to be detected. Radial shields very small, three times as long as wide, somewhat divergent, distally in contact. Upper arm-plates somewhat bell-shaped, about as long as wide, much wider proximally than distally, more or less in contact. Interbrachial areas below finely scaled. Oral shields wider than long, broadly oval. Adoral plates rather large, nearly meeting both interradially and radially. Oral papillae typical; subdental, moderate, squarish; distal, very large, erect, spatulate. Under arm-plates squarish, rather longer than broad, more or less fully in contact. Side arm-plates small, but carrying series of 6–7 (hence the name), subequal somewhat flattened, acute arm-spines, widened basally, longer than an arm-joint. Tentacle-scale, single, oval, small. Color (dried from alcohol), whitish, with faint bands on the upper side of the arms.

HOLOTYPE (M. C. Z. 3737). Torres Strait: Murray Islands, MER, south-west reef. Oct. 23, 1913. Carnegie Exp. 1913. H. L. Clark coll.

This little amphiuran was found in a crevice of a fragment of coral near low-water mark. Although it is no doubt immature, the arm-spines and the big, spatulate mouth papillae, taken with the arm-plates and single tentacle-scale, will serve to distinguish the species at any age.

494. A. SERPENTINA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 143, pl. 8, pl. 9, f. 1, 2.

6 specimens, including 2 COTYPES of "typical form," 2 COTYPES of var. *a* and 1 COTYPE of var. *b*. GULF OF PANAMA, 458–1020 fms. Lower California: southwest from Ballenas Bay, 645 fms.

495. A. STEPANOVII Tscherniawsky, 1869. Prot. Moskauer naturf. versamm., p. ? [1]

1 COTYPE. Black Sea: SEBASTOPOL.

496. A. STIMPSONII Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 116. Koehler, 1914. Bull. 84 U. S. N. M., pl. 7, f. 1, 2.

6 specimens. Florida: west coast, 42 fms.; east of Tortugas, 13 fms. Off Barbados, 69 fms. Brazil: off Cape Frio, 35 fms.

497. A. SUNDEVALLI (Müller and Troschel).

Ophiolepis sundevalli Müller and Troschel, 1842. Syst. Ast., p. 93.
Amphiura sundevalli Ljungman, 1867. Öfv. Kongl. vet.-akad. Förh., **23**, p. 320. Lütken, 1858. Add. ad hist. Oph., pt. 1, pl. 2, f. 13*a–b'* (as *A. holbölli*).

18 specimens. SPITZBERGEN: Storfjord, 38½ fms.; off Shoal Point, 25–30 fms.; Truerenberg Bay, 70 fms.; Augusti Bay, 50 fms.; Horn Sound, 17–23 fms. Greenland. Labrador: 3 miles south of Caribou Island, 50 fms. Bering Strait, 12 fms.

498. A. SYNTARACHA, sp. nov. (*συντάραχος*, perplexing). Plate **5**, f. 14, 15.

Disk 5 mm. in diameter; arms all broken but undoubtedly 50 mm. or more in length. Disk scaling, close and firm around radial shields but coarser and more open in center of disk and in interradial areas. Radial shields long and narrow (1.3 mm. by .4±), with inner margins straight and outer somewhat convex; they are parallel and close together. Upper arm-plates elliptical, much wider than long, broadly in contact. Interbrachial areas below, with scattered minute scales and calcareous grains. Oral shields small, pentagonal with rounded corners and widest proximally. Adoral plates relatively large, somewhat triangular with truncated and rounded angles, not meeting either radially or interradially. Oral papillae typical and not especially notable but the distal ones are

[1] Reference quoted from Lyman.

rather small, narrow, flattened, blunt and erect. Under arm-plates wider than long but almost square, with rounded corners, broadly in contact throughout. Side arm-plates small, carrying series of five arm-spines; the number falls to four near the middle of the arm; these spines are short, about equal to a joint, flattened, blunt and subequal; the next to the lowest spine is the widest, flattest, and most truncate of all, particularly near the middle of the arm. Tentacle-scales wanting. Color (dried from alcohol), whitish or very pale brown.

HOLOTYPE (M. C. Z. 1361). Japan: MOUTH OF THE BAY OF YEDDO. E. S. Morse collection.

Mr. Lyman left with this specimen a couple of sketches of details, with the note "6 spines, lowest longest" and the label "Amphiura." I fail to find 6 spines on even one joint, nor can I call the lowest the longest but Mr. Lyman's note was, no doubt, the result of only a hasty examination. This species is very near the Australian species *perplexa* (hence the name) so far as I can judge from Stimpson's description of that form, but the arm-spines are apparently quite different and prevent us from uniting the two under one name.

499. A. TRACHYDISCA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 149, f. 60.

25 specimens, including 12 PARATYPES. Japan[1]: PORT HIDA, 167 fms.; URAGA CHANNEL, 70–88 fms.

Species of Amphiura not represented in the M. C. Z.

500. A. ABBREVIATA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 34, pl. 4, f. 3–5. Dutch East Indies: Paternoster Islands, 15 fms. Aru Islands, 7–8 fms. Sulu Archipelago, 9–21 fms.

501. A. ABYSSORUM NORMAN, 1876. Proc. Roy. soc. London, **25**, p. 215. Northeastern Atlantic, 1785 fms.

502. A. ACCEDENS KOEHLER, 1910. Senckenb. naturf. gesellsch., **33**, p. 293, pl. 15, f. 4, 5. Aru Islands: Sungi Barkai, 8–9 fms.

503. A. AESTUARII MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 73. Japan: Misaki, Aburatsubo Cove.

504. A. AGITATA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 79, pl. 13, f. 5–7. Sulu Archipelago: north of Sulu Islands, 153 fms.

505. A. ALGIDA KOEHLER, 1911. Brit. Ant. exp. Rept. sci. invest., **2**, p. 46, pl. 7, f. 14, 15. Antarctica: Victoria Land, Ross Island, Cape Royds, 10–80 fms.

506. A. AMBIGUA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 39, pl. 4, f. 9–11. Sulu Archipelago: off Tongkil Island, 7–8 fms.

507. A. ARGENTEA LYMAN, 1879. Bull. M. C. Z., **6**, p. 21, pl. 11, f. 288–291. North of the Kermadec Islands, 600 fms.

508. A. ATLANTICA LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 321. St. Helena.

509. A. BELGICAE KOEHLER, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 27, pl. 7, f. 46–48. West Antarctica, 55–168 fms.

[1] Without definite locality.

510. A. BIHAMULA H. L. Clark, 1901. Bull. U. S. F. C., **2**, p. 247, pl. 14, f. 6–9. Porto Rico: off San Juan, 91 fms.

511. A. BREVIPES Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 149, pl. 11, f. 4–6. Ecuador: off Galera Point, 1740 fms.

512. A. BREVISPINA Marktanner-Turneretscher, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 301, pl. 12, f. 14, 15. Southern Indian Ocean: St. Paul Island.

513. A. CANADENSIS Verrill, 1899. Trans. Conn. acad., **10**, p. 311. Gulf of St. Lawrence.

514. A. CANDIDA Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 318. Koehler, 1904. Mem. Soc. zool. France, **17**, p. 67, f. 18, 19. Mozambique.

515. A. CELATA Koehler, 1905. Siboga-exp. Oph. litt., p. 35, pl. 4, f. 6–8. Amboina.

516. A. COACTA Koehler, 1905. Siboga-exp. Oph. litt., p. 33, pl. 4, f. 1, 2. Dutch East Indies: Kei Islands, Tual, 12–13 fms.

517. A. COMPLANATA Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 319. Koehler, 1914. Bull. 84 U. S. N. M., pl. 5, f. 3–6. Brazil: off Cape Frio.

518. A. CONCINNA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 77, pl. 13, f. 1, 2. South of Amboina, 1162 fms.

519. A. COREAE Duncan, 1879. Journ. Linn. soc. Zool., **14**, p. 466, pl. 10, f. 18, 19. Korean Strait, 37 fms.

520. A. CRASSIPES Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 319. Brazil: off Cape Frio.

521. A. DENTICULATA Koehler, 1896. Mem. Soc. zool. France, **9**, p. 209. 1898. Hirondelle Ech. et Oph., pl. 7, f. 28, 29. Off Newfoundland, 86 fms.

522. A. DIASTATA McClendon, 1909. Univ. Cal. Publ. Zool., **6**, suppl. page, pl. 2, f. 10, 11 (as *A. verrilli*). California: San Diego; San Pedro.

523. A. DIDUCTA Koehler, 1914. Bull. 84 U. S. N. M., p. 65, pl. 7, f. 6, 7. Cuba: off Havana.

524. A. DIGNA Koehler, 1906. Mem. Soc. zool. France, **19**, p. 17, pl. 3, f. 36, 37. Off Senegal, 1289–1296 fms.

525. A. DIVARICATA Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 318. Dutch East Indies: between Singapore and Batavia.

526. A. EXIGUA Verrill, 1899. Trans. Conn. acad., **10**, p. 311. Gulf of St. Lawrence.

527. A. FIBULATA Koehler, 1913. Zool. jahrb. Suppl. **11**, p. 359. 1914. Bull. 84 U. S. N. M., p. 56, pl. 7, f. 3–5. Florida: near Key West, 5¼ fms.

528. A. FICTA Koehler, 1910. Senckenb. naturf. gesellsch., **33**, p. 291, pl. 17, f. 9, 10. Aru Islands: Sungi Manumbai, 13 fms.; Sungi Barkai, 10 fms.

529. A. FLEXUOSA Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 319. Koehler, 1914. Bull. 84 U. S. N. M., pl. 4, f. 1, 2. Brazil.

530. A. FRAGILIS Verrill, 1885. Rept. U. S. F. C. for 1883, p. 549. Off eastern United States, 239–1467 fms.

531. A. GLABRA Lyman, 1879. Bull. M. C. Z., **6**, p. 25, pl. 11, f. 308–310. Southeast of Philippine Islands, 500 fms.

532. A. GRANDIS Koehler, 1896. Mem. Soc. zool. France, **9**, p. 246. 1909. Princesse-Alice Echinod., pl. 27, f. 3, 4. Bay of Biscay, 1456 fms. Near the Azores, 1055 fms.

533. A. HILARIS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 80, pl. 15, f. 9, 10. Dutch East Indies: Strait of Macassar, 723 fms.

534. A. INSTANS Koehler, 1905. Siboga-exp. Oph. litt., p. 38, pl. 3, f. 4–6. Aru Islands: near Jedan, 32 fms.

535. A. JOSEPHINAE Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 631. Southwest of Portugal: Josephine Bank, 160 fms.

536. A. JOUBINI Koehler, 1912. Charcot-exp. Ech., p. 132, pl. 11, f. 9, 13. West Antarctica: Marguerite Bay, 112 fms.

537. A. KINBERGIENSIS Koehler, 1914. Bull. 84 U. S. N. M., p. 52, pl. 4, f. 3, 4, pl. 5, f. 1, 2. Florida: off Fowey Rocks Light, 170 fms.

538. A. KÜKENTHALI Koehler, 1913. Zool. jahrb. Suppl. **11**, p. 356, pl. 20, f. 1–4. Florida; Tortugas. Danish West Indies; St. Thomas.

539. A. LANCEOLATA Lyman, 1879. Bull. M. C. Z., **6**, p. 24, pl. 11, f. 305–307. Northeast of New Zealand, 700 fms.

540. A. LATISPINA Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 320. Koehler, 1914. Bull. 84 U. S. N. M., pl. 4, f. 5, 6. South Atlantic Ocean: off La Plata River.

541. A. LEPTODOMA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 143, f. 56. Bering Sea, 482 fms,

542. A. MICRASPIS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 150, f. 61. Japan: Hondo Island, off Omai Saki Light, 36 fms.

543. A. MICRODISCOIDA, nom. nov. for *Hemipholis microdiscus* Duncan, 1879. Journ. Linn. soc. Zool., **14**, p. 467, pl. 10, f. 20–22. Korean Strait, 51 fms. Evidently an Amphiura but not *A. microdisca* Lütken, 1856.

544. A. MODESTA Studer, 1882. Gazelle Oph., p. 18, pl. 2, f. 9*a–e*. Off New Zealand, 597 fms.

545. A. MOROSA Koehler, 1905. Siboga-exp. Oph. litt., p. 37, pl. 3, f. 12–14. Dutch East Indies: near Salawatti, 10 fms.

546. A. MORTENSENI Koehler, 1907. Zool. anz., **32**, p. 147. 1908. Trans. Roy. soc. Edinburgh. **46**, p. 604, pl. 14, f. 121, 122. South Orkney Islands, 9–10 fms.

547. A. MÜLLERI Marktanner-Turneretscher, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 300, pl. 13, f. 25, 26. Atlantic Ocean: east of St. Pauls Rocks.

548. A. NOCIVA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 78, pl. 15, f. 3–5. Dutch East Indies: Kei Islands, south of Kur, 113 fms.

549. A. NORAE Benham, 1909. Records Canterbury mus., **1**, p. 104, pl. 10, f. 1–3. New Zealand: off Cape Kidnappers.

550. A. PERITA Koehler, 1905. Siboga-exp. Oph. litt., p. 36, pl. 3, f. 9–11. Dutch East Indies: Solor Strait, 63 fms.

551. A. PERPLEXA (Stimpson), 1855. Proc. Acad. nat. sci. Phil., **7**, p. 386 (*Ophiolepis*). New South Wales: Port Jackson.

552. A. POLITA Koehler, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 29, pl. 7, f. 49, 50, pl. 8, f. 51. West Antarctica, 55–333 fms.

553. A. POLYACANTHA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 146, pl. 9, f. 3–5. Panama: off Cape Mala, 695 fms.

554. A. PRAEFECTA Koehler, 1907. Bull. sci., **41**, p. 302, pl. 10, f. 13, 14. New Zealand: Campbell Islands.

555. A. PRINCEPS Koehler, 1907. Bull. sci., **41**, p. 303, pl. 12, f. 28, 29. Strait of Magellan.

556. A. PSILOPORA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 153, f. 63. East Siberia: Plover Bay, 15–20 fms.

557. A. PUSILLA Farquhar, 1897. Journ. Linn. soc. Zool., **26**, p. 191, pl. 14, f. 1–3. New Zealand: Cook Strait.

558. A. PYCNOSTOMA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 151, f. 62. Off eastern Japan, 440 fms.

559. A. RATHBUNI Koehler, 1914. Bull. 84 U. S. N. M., p. 50, pl. 18, f. 5, 7. Porto Rico: Mayaguez Harbor, 16–17 fms.

560. A. RICHARDI Koehler, 1896. Mem. Soc. zool. France, **9**, p. 245. 1909. Princesse-Alice Echinod., pl. 27, f. 1, 2. Vicinity of the Azores, 647–830 fms.

561. A. SCRIPTA Koehler, 1904. Mem. Soc. zool. France, **17**, p. 70, f. 23, 24. Arabia.

562. A. SEMINUDA Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 148, pl. 11, f. 1–3. Gulf of California, 852 fms.

563. A. TOMENTOSA Lyman, 1879. Bull. M. C. Z., **6**, p. 23, pl. 11, f. 299–301. Kerguelen Island: Balfour Bay, 20–60 fms.

564. A. UNCINATA Koehler, 1904. Siboga-exp. Oph. mer prof., p. 76, pl. 14, f. 3, 4. Dutch East Indies: off Java, 183 fms.; Sumbawa, Bima Bay, 139 fms.

565. A. VADICOLA Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 71. Japan: Kagoshima Gulf, Sakurajima.

566. A. VELOX Koehler, 1910. Senckenb. naturf. gesellsch., **33**, p. 292, pl. 15, f. 6, pl. 16, f. 5. Aru Islands: Wokam, 23 fms.

567. A. VERTICILLATA Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 320. Galapagos Islands.

Amphiocnida.

Verrill, 1899. Trans. Conn. acad., **10**, p. 307, 316.

Type-species: *Ophiocnida putnami* Lyman, 1871. Illus. cat. M. C. Z., no. 6, p. 11. Type designated.

568. A. BRACHIATA (Montagu).

Asterias brachiata Montagu, 1804. Trans. Linn. soc., **7**, p. 84. Bell, 1892. Cat. Brit. Ech. Brit. mus., pl. 13, f. 3–5 (as *Ophiocnida brachiata*).

Amphiocnida brachiata Verrill, 1899. Trans. Conn. acad., **10**, p. 318.

7 specimens. England: Devonshire, Salcombe. France: Arcachon; "Cape Breton" (some point on the coast of Bretagne is probably meant). Algeria. Naples.

569. A. DILATATA (Koehler).

Ophiocnida dilatata Koehler, 1905. Siboga-exp. Oph. litt., p. 30, pl. 12; f. 2–4.

1 specimen. Torres Strait: Murray Islands, Mer.

570. A. INEQUALIS, sp. nov. Plate **9**, f. 5, 6.

Disk 10 mm. in diameter; arms all broken but evidently about 100 mm. long, and possibly even more. Disk more or less puffed, covered with numerous very fine scales, many of which bear, each, a slender spinelet; but the covering of spinelets as a whole is sparse. Radial shields about 2 mm. long and .7 mm. wide, slightly curved, very close together, and distally in contact. Upper arm-plates elliptical, at first as long as broad, or longer, but soon becoming much wider than long, more or less in contact. Interbrachial spaces below with scattered, minute plates bearing spinelets. Oral shields (except madreporite), shield-shaped, about as long as broad; madreporite conspicuous broadly oval, widest just proximal to middle. Adoral plates very small, distinguishable only with difficulty. Oral papillae, 2 on each side; proximal or subdental papillae, large and thick; distal papillae, stout, thick and erect. Under arm-plates squarish; distal margin concave or notched; at first longer than broad but becoming somewhat broader than long. Side arm-plates moderate, each bearing a series of 6 or 7 (rapidly decreasing to 5) very unequal arm-spines (hence the name); the lowest spine is longest and is flat and blunt; it about equals a joint and a half; the uppermost spine is similar but shorter; the middle (3 and 4) spines are the smallest and do not equal the arm-joint; they are also the narrowest and least flattened; the inequality of size is marked only near base of arm and is scarcely noticeable near tip. Tentacle-scales none. Color (dried from alcohol), pale brownish.

HOLOTYPE (M. C. Z. 1511). HONG KONG. March, 1861. W. H. A. Putnam.

This specimen has no notes by Mr. Lyman but bears only the name Amphiura. As it is in very poor condition, all the arms being broken and the disk half gone, it was probably put aside in the hope of further material. Such has not been forthcoming and the species is well characterized by the peculiar inequality of the arm-spines. Probably *pilosa* is its nearest ally but the two cannot be confused the arm-spines are so different, to say nothing of the upper arm-plates.

571. A. PILOSA (LYMAN).
Ophiocnida pilosa LYMAN, 1879. Bull. M. C. Z., **6**, p. 32, pl. 12, f. 341–343.
Amphiocnida pilosa VERRILL, 1899. Trans. Conn. acad., **10**, p. 318.

2 specimens, including 1 COTYPE. Australia: BASS STRAIT, 38 fms. New South Wales: off Cape Three Points, 41–50 fms.

572. A. PUTNAMI (LYMAN).
Ophiocnida putnami LYMAN, 1871. Illus. cat. M. C. Z., no. 6, p. 11, pl. 1, f. 9.
Amphiocnida putnami VERRILL, 1899. Trans. Conn. acad., **10**, p. 316, 318.

HOLOTYPE. HONG KONG.

Species of Amphiocnida not represented in the M. C. Z.

573. A. ALBOVIRIDIS (BROCK), 1888. Zeits. f. wiss. zool., **47**, p. 488. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 71, f. 25, 26 (*Ophiocnida*). Amboina.

574. A. ASPERA (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 29, pl. 2, f. 10, 11, 13 (*Ophiocnida*). Dutch East Indies: Strait of Macassar, 19 fms.; Talaut Islands, 20 fms.

575. A. VERTICILLATA (DÖDERLEIN), 1896. Jena. denkschr., **8**, p. 287, pl. 14, f. 2a, 2b, pl. 15, f. 7, 7a (*Ophiocnida*). Amboina.

HEMIPHOLIS.

LYMAN, 1865. Illus. cat. M. C. Z., no. 1, p. 12, 137.

Type-species: *Ophiura elongata* SAY, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 146. Monotypic when established.

576. H. ELONGATA (SAY).
Ophiura elongata SAY, 1825. Journ. Acad., nat. sci. Phil., **5**, p. 146.
Hemipholis elongata LYMAN, 1865. Illus. cat. M. C. Z., no. 1, p. 137, pl. 1, f. 1–3 (colored) (as *H. cordifera*).

84 specimens. South Carolina: CHARLESTON. Brazil: Desterro.

[1] Owing to an unfortunate error, figures 10 and 12 on pl. **2**, Siboga littoral ophiurans, have exchanged their numbers; hence all text references to those figures are wrong. The same is true of figs. 5 and 7 of the same plate.

577. H. GRACILIS Verrill, 1867. Trans. Conn. acad., **1**, p. 262. Plate **9**, f. **7**, 8.

1 cotype. Panama: Pearl Islands, 4–6 fms.

Ophiophragmus.

Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 12, 131.

Type-species: *Amphiura wurdemanii* Lyman, 1860. Proc. Boston soc. nat. hist., **7**, p. 196. Type here first definitely designated.

578. O. BRACHYACTIS, sp. nov. (βραχύς, short + ἀκτίς, ray). Plate **10**, f. 13, 14.

Disk 7 mm. in diameter; arms less than 30 mm. long (hence the name). Disk covered with a coat of coarse scales, about 8 series from center to margin and about 6 series across an interradial area; the six primary plates form a compact group at center; around the margin of the disk, interrupted only where the genital plates join the radial shields, is a close-set series of low, blunt cylindrical spinelets. Radial shields in close contact, about 1.5 mm. long by 1 mm. wide, broadest distally. Upper arm-plates broadly in contact throughout, very short, the width equalling three times the length or more; they are often broken in two. Interbrachial spaces below covered by a dense coat of rather coarse scales. Oral shields very small, diamond-shaped with rounded angles, rather longer than wide. Adoral plates relatively large, 4- or 5-sided, meeting broadly within. Oral papillae, 3 on each side of the jaw, the innermost thick and Amphiura-like, the others scale-like and subequal. First under arm-plate large, equal to the adoral plates and completely separating them; succeeding plates wider than long, or square, broadly in contact throughout. Side arm-plates low and inconspicuous; each carries a series of three short, thick, blunt, subequal (or uppermost smallest) spines about as long as the arm-joint or a little longer. Tentacle-scales two, one on the side arm-plate and one on the under arm-plate, except on the first arm-pore where there is no scale on the side arm-plate. Color (dried from alcohol), whitish; the arms show faint indications of having been banded.

Holotype (M. C. Z. 1120). Florida: off Sombrero Key, 47 fms., April 2, 1872. Wm. Stimpson coll.

With this specimen, Mr. Lyman has the note: "sp. nov. near *Wurdemani* Scaling flatter, coarser. Mouth different. Arms shorter?" None of our specimens of *wurdemanii* show any approach to this specimen in either the character of the disk-scaling or the length of the arms. It differs from *septus* in the length of the arms and the number of tentacle-scales. It is very near

the Pacific species *marginatus* but again the short arms distinguish it, while the under arm-plates are also different.

579. O. JAPONICUS Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 70.

1 cotype. Japan: Kagoshima Gulf, 8–15 fms.

580. O. WURDEMANII (Lyman).
Amphiura wurdemanii Lyman, 1860. Proc. Boston soc. nat. hist., **7**, p. 196.
Ophiophragmus wurdemanii Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 12, 132. Koehler, 1914. Bull. 84 U. S. N. M., pl. 8, f. 1, 2.

21 specimens, including the holotype. North Carolina: shoals between Beaufort and Fort Macon. Florida: Charlotte Harbor.

Species of Ophiophragmus not represented in the M. C. Z.

581. O. MARGINATUS (Lütken), 1859. Add. ad hist. Oph., pt. 2, p. 119, pl. 3, f. 3*a*, *b* (*Amphiura*). Costa Rica: west coast, Punta Arenas.

582. O. SEPTUS (Lütken), 1859. Add. ad hist. Oph., pt. 2, p. 120 (*Amphiura*). 1872. Ov. Kongl. Danske vid. selsk. Forh., pl. 2, f. 3*a*, *b* (*Amphipholis*). Danish West Indies: St. Thomas.

Ophionephthys.

Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 24, 25, 93, 98.

Type-species: *O. limicola* Lütken, 1869. *op. cit.*, p. 24, 25.

583. O. ECNOMIOTATA (H. L. Clark).
Amphiura ecnomiotata H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 148, f. 59.

1 specimen, and a fragment of the arm of the holotype. Japan: Mouth of the Bay of Yeddo; off east coast, 31–41 fms.

584. O. LIMICOLA Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 24, 25, fig.

3 cotypes, without disks. St. Thomas, D. W. I.

585. O. OCTACANTHA, sp. nov. (ὀκτώ, eight + ἄκανθα, spine). Plate **9**, f. 9, 10.

Disk 5 mm. in diameter but greatly shrunken in drying and its real measurement when complete was certainly not less than 8 mm. Arms all broken, but evidently very long, probably 75 mm. at least. Disk naked save for a narrow circle of very fine scales surrounding each radial shield except along the inner distal margin where the two shields are in contact. Radial shields about 1.5 mm. long but not more than .4 mm. broad, in contact distally and very slightly divergent thence proximally. Upper arm-plates very small, decidedly longer

than broad, narrower distally than proximally, with rounded angles (especially distally), slightly in contact throughout; distally they tend to become as wide as long and are relatively larger compared to the width of the arm. Interbrachial areas below naked. Oral shields of moderate size, pentagonal with rounded angles, widest proximally. Adoral plates small, roughly triangular, not meeting proximal to oral shields. Oral papillae as in Amphiura; subdental pair not peculiar; distal pair rather large, flat, longer than broad; papillae adjoining first oral tentacles conspicuous and very acute. Under arm-plates longer than wide, the first two or three very much so; squarish, in contact throughout, distal margin notched. Side arm-plates large but not meeting either above or below; each one carries a series of 8 (or 7) delicate, flattened blunt arm-spines, most of which are more or less rough or minutely spiny at tip; lowest spine longest and much exceeding an arm-joint; the others successively shorter to the uppermost which is very small. Tentacle-scales none. Color (dried):— disk brown, radial shields and scales whitish; arms dull yellow with numerous bands of blackish; each band 4 or 5 arm-joints wide.

Holotype (M. C. Z. 3744). Torres Strait: Friday Island, on sandy flat, under a stone. Sept. 13, 1913. Carnegie Exp. 1913. H. L. Clark coll.

Notes on this specimen made the day it was taken read, "Colors red, blue, and yellow, much dulled and paled in drying. Disk 8–10 mm." No doubt it is very closely related to *ecnomiotata* from Japan but aside from the striking coloration (the Japanese species shows no sign of banded arms), the form of the distal oral papillae, the shape of the oral shields, and the number of arm-spines, all preclude its being referred to that species.

586. O. PHALERATA Lyman, 1874. Bull. M. C. Z., **3**, p. 229, pl. 6, f. 7–9.

Holotype. Philippine Islands.

Amphipholis.

Ljungman, 1866. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 165.

Type-species: *Amphipholis januarii* Ljungman, 1866. *loc. cit.* = *Ophiolepis gracillima* Stimpson, 1852. Proc. Boston soc. nat. hist., **4**, p. 224. Monotypic when established.

587. A. ABNORMIS (Lyman).

Ophiocnida abnormis Lyman, 1878. Bull. M. C. Z., **5**, p. 227, pl. 2, f. 37–39.
Amphipholis abnormis Verrill, 1899. Trans. Conn. acad., **10**, p. 312.

Holotype. Gulf of Mexico, 101 fms.

588. A. AUSTRALIANA H. L. CLARK, 1909. Mem. Austr. mus., **4**, p. 540, pl. 52, f. 1–3.

2 PARATYPES. New South Wales: OFF WATA MOOLI, 54–59 fms.

589. A. GEMINATA (LECONTE). Plate **6**, f. 7, 8.

Ophiolepis geminata LECONTE, 1851. Proc. Acad. nat. sci. Phil., **5**, p. 317.
Amphipholis geminata LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 313.

4 specimens, including a COTYPE. PANAMA.

590. A. GRACILLIMA (SIMPSON). Plate **6**, f. 5, 6.

Ophiolepis gracillima STIMPSON, 1852. Proc. Boston soc. nat. hist., **4**, p. 224.
Amphipholis gracillima LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 314.

4 specimens, including a COTYPE, and also a cotype of *Amphipholis januarii* Ljungman. South Carolina: CHARLESTON, NEAR FORT JOHNSON. St. Thomas, D. W. I. Brazil: Rio Janeiro, 4 fms.

591. A. GRANULATA (LÜTKEN and MORTENSEN).

Amphiura granulata LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 155, pl. 10, f. 1–4.

2 COTYPES. Locality? Presumably eastern tropical Pacific.

592. A. JAPONICA MATSUMOTO, 1915. Proc. Acad. nat. sci., Phil., **67**, p. 71.

1 COTYPE. Japan: MISAKI, ARAI BEACH.

593. A. KINBERGI LJUNGMAN, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 646. Plate **6**, f. 9, 10.

1 COTYPE. CAPE OF GOOD HOPE.

594. A. KOCHII LÜTKEN, 1872. Ov. Kongl. Danske. vid. selsk. Forh., p. 84, pl. 1, f. 6*a*, *b*.

1 specimen. Japan: Misaki, Aria Beach.

595. A. LAEVIDISCA H. L. CLARK, 1909. Mem. Austr. mus., **4**, p. 541. Plate **6**, f. 3, 4.

HOLOTYPE. Chile: TALCAHUANO BAY.

596. A. PENTACANTHA, sp. nov. (πέντε, five + ἄκανθα, spine). Plate **6**, f. 1, 2.

Disk 4 mm. in diameter; arms about 12 mm. long. Closely related to *A. squamata* but readily distinguished from that species and all the other members of the genus by the absence of tentacle-scales and the number and length of the arm-spines. The disk-covering consists of somewhat coarser scales than in *squamata* but the radial shields, upper arm-plates and mouth-parts are essentially as in that species. There are 5 arm-spines on the basal arm-joints but the number quickly drops to 4 and distally to 3; the spines are subequal or the uppermost is longest, hollow, rather slender, bluntly pointed and are (at least on the basal joints) half again as long as an arm-joint. The tentacle-pores are large; on the first arm-joint of two of the arms, there are two tentacle-scales at each

pore but on the other arms only one; on the second and third joints of each arm a single scale guards the pore; beyond the third joint, there are no tentacle-scales. The under arm-plates are as wide as long or wider, even distal to the middle of the arm. Color (dried from alcohol), nearly white.

HOLOTYPE (M. C. Z. 1437). OFF ST. LUCIA, 226 fms. Blake St. 215.

Mr. Lyman refers to this specimen in the Blake Report as "Amphiura tenuispina Ljn." but he labeled the specimen "Amphiura tenuispina var." There can be no doubt I think that it is not merely a variety of *tenuispina* but a perfectly distinct species. Indeed, for this genus, it is remarkably well-marked since none of the other species lack tentacle-scales, except of course on the distal half of the arm in very young specimens. In *tenuispina* and *squamata*, the under arm-plates are noticeably longer than broad beyond the middle of the arm.

597. A. PUGETANA (LYMAN).

Amphiura pugetana LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 193.
Amphipholis pugetana LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 312. MCCLENDON, 1909. Univ. Cal. publ. Zool., **6**, pl. 2, f. 12, 13.

37 specimens. Off Alaskan Peninsula, 21 fms. Off Alaska, 68 fms. PUGET SOUND: Friday Harbor. California: Crescent City; Mendocino. Peru: near Callao, San Lorenzo Island, $2\frac{1}{2}$ fms.

598. A. SQUAMATA (DELLE CHIAJE).

Asterias squamata DELLE CHIAJE, 1828. Mem. anim. sans Vert. Napoli, **3**, p. 74.
Amphipholis squamata VERRILL, 1899. Trans. Conn. acad., **10**, p. 312. H. L. CLARK, 1904. Bull. U. S. F. C. for 1902, p. 560, pl. 6, f. 33, 34; pl. 7, f. 43, 44.

424 specimens. Algeria. NAPLES. Adriatic Sea: Spezia. Norway. Denmark: Oresund. England: Liverpool. Nova Scotia: Cape Breton. New Brunswick: Grand Manan. Maine: Eastport; Casco Bay. Massachusetts: Nahant; Boston; Vineyard Sound, $4\frac{1}{2}$ fms.; Woods Hole. Rhode Island: Newport. Florida: off Carysfort Reef, 117 fms.; off Sombrero Key, 195 fms.; off Alligator Reef, 110–118 fms. Bermuda. Jamaica: Montego Bay. Off Barbados, 100 fms. Brazil: off Cape Frio, 35 fms. Juan Fernandez. California. Hawaii: Hilo. Society Islands. New Zealand: Wellington; Island Bay. Kermadec Islands: Sunday Island, Coral Bay. Torres Strait: Murray Islands, Mer. Philippine Islands.

599. A. TENUISPINA (LJUNGMAN).

Amphiura tenuispina LJUNGMAN, 1864. Öfv. Kongl. Vet.-akad. Förh., **21**, p. 360, pl. 15, f. 1.
Amphipholis tenuispina LJUNGMAN, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 633.

13 specimens. Sweden: BOHUSLÄN. Norway. Lofoden Islands.

Species of Amphipholis not represented in the M. C. Z.

600. A. BANANENSIS (Koehler), 1911. Ann. Inst. oceanog., **2**, fasc. 5, p. 14, pl. 2, f. 34 (*Amphiura*). Belgian Congo: near Banana.

601. A. INSTRUCTA (Koehler), 1906. Mem. Soc. zool. France, **19**, p. 18, pl. 2, f. 24, 25 (*Amphiura*). Cape Verde Islands: entrance to roadstead at Porto Grande.

602. A. MICRODISCUS (Lütken), 1856. Vid.-med., p. 26 (*Amphiura*). Costa Rica: west coast, Punta Arenas.

603. A. MINOR (Döderlein), 1910. Schultze's Zool. anth. Ergeb., **4**, lfg. 1, p. 253, pl. 5, f. 3, 3a. (*Ophiactis*). Southwest Africa: Lüderitz Bay.

604. A. MISERA (Koehler), 1899. Investigator deep sea Oph., p. 45, pl. 8, f. 64, 65 (*Amphiura*). Andaman Islands, 265 fms.

605. A. MUREX (Koehler), 1908. Trans. Roy. soc. Edinburgh, **46**, p. 633, pl. 13, f. 115, 116 (*Amphiura*). Brazil: off Itaunas, 36 fms.

606. A. PATAGONICA Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 646. Strait of Magellan.

607. A. PUNTARENAE (Lütken), 1856. Vid. med., p. 25 (*Amphiura*). Costa Rica: west coast, Punta Arenas.

608. A. SUBTILIS Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 314. Brazil: Rio Janeiro.

609. A. TORELLI Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 645. Iceland.

610. A. VIOLACEA (Lütken), 1856. Vid. med., p. 26 (*Amphiura*). Nicaragua: west coast, Realejo.

611. A. VITAX (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 82, pl. 13, f. 3, 4 (*Amphiura*). Dutch East Indies: between Flores and Solor, 137 fms.

Ophiochytra.

Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 8.

Type-species: *Ophiochytra epigrus* Lyman, 1880. *loc. cit.* Monotypic when established.

612. O. TENUIS Lyman, 1883. Bull. M. C. Z., **10**, p. 254, pl. 3, f. 16–18.

8 specimens, including HOLOTYPE and 6 PARATYPES. Off Martinique, 334 fms. Off the Grenadines, 338 fms. Off Grenada, 291 fms.

Species of Ophiochytra not represented in the M. C. Z.

613. O. EPIGRUS Lyman, 1880. Anniv. mem. Boston soc. nat. hist., p. 8, pl. 2, f. 17–19. Near the Paumotu Islands, 2350 fms.

Ophiostigma.

Lütken, 1856. Vid. med., p. 13.

Type-species: *Ophiostigma tenue* Lütken, 1856. *loc. cit.* Type designated.

614. O. AFRICANUM Lyman, 1879. Bull. M. C. Z., **6**, p. 41, pl. 13, f. 368–370.

2 COTYPES. Cape Verde Islands: St. Vincent.

615. O. ISACANTHUM (SAY).

Ophiura isacantha SAY, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 150.
Ophiostigma isacanthum LYMAN, 1865. Illus. cat. M. C. Z., no. 1, p. 103. KOEHLER, 1913. Zool. jahrb. suppl., **11**, pl. 20, f. 6, 7.

40 specimens. FLORIDA: off west coast; off Tortugas, 16–36 fms.; off Key West, 3–5 fms.; off Carysfort reef, 40 fms.; off Garden Key, 63 fms.; Biscayne Bay. Jamaica: Port Royal. Off St. Cruz, D. W. I., 115 fms.; Flannegan Passage, 27 fms. Brazil: off Cape Frio, 35 fms.

Species of Ophiostigma not represented in the M. C. Z.

616. O. FORMOSA LÜTKEN, 1872. Ov. Kongl. Danske. vid. selsk. Forh., p. 77, pl. 2, f. 5*a*, *b*. Formosa Strait, 17 fms.

617. O. TENUE LÜTKEN, 1856. Vid. med., p. 13. KOEHLER, 1913. Zool. jahrb. Suppl., **11**, pl. 20, f. 8, 9. Nicaragua: west coast, Realejo.

AMPHILEPIS.

LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 322.

Type-species: *Amphiura norvegica* LJUNGMAN, 1864. Öfv. Kongl. Vet.-akad. Förh., **21**, p. 363. Monotypic when established.

618. A. NORVEGICA (LJUNGMAN).

Amphiura norvegica LJUNGMAN, 1864. Öfv. Kongl. Vet.-akad. Förh., **21**, p. 363, pl. 15, f. 3, 3*a–d*.
Amphilepis norvegica LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 322.

10 specimens. Sweden: Bohuslän. Norway[1]: Trondjheim Fjord. Lofoden Islands, 200–300 fms. Western Atlantic Ocean, 1350 fms.

619. A. PLATYTATA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 171, f. 76.

4 PARATYPES. OFF ALASKA, 1569 fms.

Species of Amphilepis not represented in the M. C. Z.

620. A. ANTARCTICA KOEHLER, 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, pl. 13, f. 113, 114. South Orkneys: Scotia Bay, 9–10 fms.

621. A. MOBILIS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 94, pl. 20, f. 6, 7. Dutch East Indies: off Java, 183 fms.; off Bali, 124 fms.; off Rotti, 120 fms.

622. A. PAPYRACEA LYMAN, 1879. Bull. M. C. Z., **6**, p. 34, pl. 16, f. 429–431. Dutch East Indies: north of Celebes, 2150 fms.

623. A. PATENS LYMAN, 1879. Bull. M. C. Z., **6**, p. 34, pl. 12, f. 338–340. Chile: off Valparaiso, 2160 fms.

624. A. PROTECTA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 94, pl. 23, f. 8, 9. Dutch East Indies: Celebes, off Gulf of Boni, 643 fms.

625. A. TENUIS LYMAN, 1879. Bull. M. Z. C., **6**, p. 35, pl. 16, f. 432–434. Off east coast of Japan, 1875 fms.

[1] Without definite locality.

Amphiodia.

Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 25.

Type-species: *Amphiura pulchella* Lyman, 1869. Bull. M. C. Z., **1**, p. 337. Type designated.

626. A. ANCISTROTA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 161, f. 69.

12 paratypes. Japan: off east coast, 55–153 fms.; Uraga Strait, 70 fms.

627. A. ATRA (Stimpson). Plate **8**, f. 5–7.

Ophiolepis atra Stimpson, 1852. Proc. Boston soc. nat. hist., **4**, p. 225.
Amphiodia atra Verrill, 1899. Trans. Conn. acad., **10**, p. 313.

1 specimen, probably a cotype. South Carolina: Charleston, Fort Johnson.

628. A. BARBARAE (Lyman).

Amphiura barbarae Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 17, pl. 3, f. 32–34.
Amphiodia barbarae Verrill, 1899. Trans. Conn. acad., **10**, p. 313.

Holotype and 6 paratypes. California: 5 miles south of Santa Barbara, 22 fms.

629. A. CHILENSIS (Müller and Troschel).

Ophiolepis chilensis Müller and Troschel, 1843. Arch. naturg., **9**, p. 120.
Amphiodia chilensis Verrill, 1899. Trans. Conn. acad., **10**, p. 313. H. L. Clark, 1910. Bull. M. C. Z., **52**, p. 341, pl. 9, f. 1.

2 specimens. Chile: Calbuco; Talcahuano.

630. A. CRATERODMETA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 155, f. 65.

19 paratypes. Bering Sea, 43 fms. Alaska[1]: Iliuliuk. Unalaska: Captains Harbor, 9–15 fms. Off Kamtchatka, 58–69 fms. Gulf of Tartary, 318 fms.

631. A. DIGITULA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 162, f. 70.

1 cotype. Off eastern Japan, 45–48 fms.

632. A. EURYASPIS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 158, f. 67.

21 paratypes. Bering Sea, 225 fms. Gulf of Tartary, 318 fms. Sea of Japan, 250 fms.

633. A. GYRASPIS, sp. nov. (γῦρος, round + ἀσπίς, shield). Plate **7**, f. 1–4.

Disk, 7 mm. in diameter; arms all broken, but judging from other specimens they were about 70 mm. long. Disk flattened, covered with a coat of rather

[1] Without definite locality.

fine scales, more than 12 series from center to margin and 9–11 across an interradial area; primary plates not distinguishable. Radial shields small, wide and rounded (hence the name), 1.3 mm. long, .7 mm. wide, closely in contact. Upper arm-plates twice as wide as long, or even wider; proximal margin much narrower than distal which is more or less convex; lateral margins rounded. Interbrachial areas below covered with very fine scales, the most distal series of which stands almost vertical and shows above the coarser scaling of the disk as a very delicate border. Oral shields (except madreporite) diamond-shaped, much longer than wide; madreporite ovate, somewhat larger than the other shields. Adoral plates, rounded trigonal, meeting within. Oral papillae, 3 on each side, the distal one usually largest; subdental papillae small, narrow, divergent orally; distal papillae, large, thick, angular, as long as wide; middle papillae, thick and concave proximally where they overlap the subdental ones; in specimens other than the type, they may be as large as the distal ones and are sometimes larger. Under arm-plates distinctly wider than long, pentagonal with a proximal angle and distal margin more or less notched; separated or somewhat in contact. Side arm-plates moderate, often meeting below but not above; each plate carries 3 arm-spines, subequal, terete, acute, and rather longer than an arm-joint. Tentacle-scales 2, large and subequal. Color (dried from alcohol), disk grayish, arms pale brownish or fawn-color.

Five PARATYPES (M. C. Z. 1442), four lacking the disk. Porto Rico: MAYAGUEZ HARBOR, $4\frac{1}{2}$ fms. Fish Hawk Station 6057.

This species is the one recorded in my report on the echinoderms of Porto Rico (1901. Bull. U. S. Fish Comm., **2**, p. 247) as *Amphipholis goesii* Ljungman. It is not that species and is better regarded as an Amphiodia than an Amphipholis, though in some specimens the distal mouth papilla is much the largest. Specimens 9 mm. across the disk have more numerous disk-scales than the type, there being more than 20 series between center and interradial margin and 16–18 across an interradial area. Comparison of our specimens with other West Indian species of Amphiodia show that *atra* is probably the nearest relative of *gyraspis*, the disk-scaling and the arm-spines and plates being quite similar in the two. In *atra* however the radial shields are very much larger and the scaling of the interbrachial areas, below, is noticeably finer. Other minor differences are also present, but as there is only one imperfect specimen of *atra* at hand for comparison, these may prove to be individual peculiarities. The holotype of this species is in the U. S. N. M., Cat. No. 34587, and is from the same Fish Hawk station as the paratypes listed above.

634. A. LIMBATA (Grube). Plate 8, f. 3, 4.
Ophiolepis limbata Grube, 1860. Nov. act. Acad. Caes. Leop., **27**, p. 34.

3 specimens. Brazil: Rio Janeiro.

635. A. MACRASPIS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 157, f. 66.

15 paratypes. Off Washington, 115 fms. Off eastern Japan, 501–749 fms.

636. A. MESOPOMA, sp. nov. (μέσος, middle + πῶμα, lid). Plate 6, f. 11–14.

Disk 7 mm. in diameter; arms about 55 mm. long, rather wide at base and tapering evenly to tip. Disk covered with a coat of rather coarse scales, with the six primary plates forming a compact group at center; from this group to margin of disk one may count about 10 series of scales, and about the same number across an interradial area between the radial shields. The latter are small and narrow, 1.5 mm. long by .5 mm. broad; they are nearly parallel and separated for their entire length. Upper arm-plates very wide and in contact for their full breadth throughout; the length of each is about one third the width; the distal corners are rounded. The interbrachial areas below are fully covered with coarse scales. Oral shields (except madreporite) narrow, longer than wide, somewhat triangular with the short distal margin strongly convex, the other two sides quite straight; madreporite large and swollen, nearly circular. Adoral plates slender triangular, one angle separating the oral shield from the side arm-plate, a second in contact with the first under arm-plate and the third meeting its fellow proximal to the oral shield. Oral papillae 3 on a side, the middle one largest and lid-like (hence the name); subdental pair, close together, thick and squarish; distal pair scale-like, somewhat smaller than middle pair. Under arm-plates squarish, the first one very small, the succeeding ones moderately large, as long as wide but becoming wider than long at middle of arm and finally longer than wide at tip; all quite closely in contact. Side arm-plates low and small; each carries three arm-spines of subequal length, rather longer than an arm-joint; upper and lower spines more or less pointed and little flattened, but middle spine, especially near middle of arm, flat, broad, and truncate. Tentacle-scales 2, large, subequal; the scale borne on under arm-plate equals that plate in length. Color in life, disk fawn-colored with here and there orange-brown markings; arms whitish; dried from formalin and corrosive sublimate, the disk is pale yellowish gray, the arms dirty whitish.

Holotype (M. C. Z. 3740). Torres Strait: Badu, under a rock in a few feet of water near shore. Nov. 1, 1913. Carnegie Exp., 1913. F. A. Potts coll.

This interesting amphiuran is nearly related apparently to *Amphiodia chilensis* (Müller & Troschel) but differs from that species in many ways; the disk-scaling is coarser, the radial shields are longer and narrower, and the oral papillae and tentacle-scales are conspicuously larger; moreover the upper and lower arm-spines are more or less terete and pointed instead of being thick and truncate as all three spines are in *chilensis*. None of the Amphiodias collected by the SIBOGA in the East Indies approach very nearly to this Torres Strait form but Brock collected at Amboina, and Semon at Thursday Island, species which are closely related. From Brock's *ochroleuca*, the scaling of the disk and the form of the upper arm-plates distinguish *mesopoma*, while the same characters and the color serve to separate the latter from the Thursday Island species, *brocki* Döderlein. It is of course possible that a large series of East Indian specimens might show that the characters mentioned are matters of individual diversity, but in the absence of material we have no right to assume this, and I therefore keep the three species separate.

637. O. OCCIDENTALIS (LYMAN).

Amphiura occidentalis LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 194. 1865. Illus. cat. M. C. Z., no. 1, p. 130, f. 12, 13.
Amphiodia occidentalis VERRILL, 1899. Trans. Conn. acad., **10**, p. 313.

40 specimens, including 2 COTYPES. Gulf of Georgia. Washington: Puget Sound, Ballard. California[1]: Mendocino; San Francisco Bay, off Angel Island, 8½–12½ fms.; off Goat Island, 8½–11 fms.; southwest of Farallones Light, 60–68 fms.; MONTEREY.

638. A. PARTITA (KOEHLER).

Amphiura partita KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 336, pl. 7, f. 50, 51.

3 specimens. Northwest of Bombay, India, 411–556 fms.

639. A. PERIERCTA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 160, f. 68.

1 PARATYPE. OFF OREGON, 30 fms.

640. A. PLANISPINA (VON MARTENS). Plate **8**, f. 8, 9.

Amphiura planispina VON MARTENS, 1867. Monatsb. K-Preuss. akad. wiss. Berlin, p. 347.
Amphiodia planispina VERRILL, 1899. Trans. Conn. acad., **10**, p. 313.

3 specimens, including 2 COTYPES. Brazil: RIO JANEIRO; Porto Seguro.

641. A. PSILOCHORA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 165, f. 72.

3 PARATYPES. Japan: SAGAMI SEA, 292–622 fms.

[1] Without definite locality.

642. A. REPENS (LYMAN).

Amphiura repens LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 18, pl. 3, f. 38–40.
Amphiodia repens VERRILL, 1899. Trans. Conn. acad., **10**, p. 313.

7 specimens, including HOLOTYPE and 2 PARATYPES. Florida: WEST COAST, 13–14 fms. Jamaica: Port Antonio, Titchfield Reef. Brazil: Rio Janeiro.

643. A. RIISEI (LÜTKEN).

Amphiura riisei LÜTKEN in LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 258. LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, pl. 3, f. 2*a*, *b* (as *A. cordifera*).
Amphiodia riisei VERRILL, 1899. Trans. Conn. acad., **10**, p. 313.

1 specimen. Brazil: Rio Janeiro, 4 fms.

644. A. STRONGYLOPLAX H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 164, f. 71.

2 PARATYPES. OFF WASHINGTON, 171 fms.

645. A. URTICA (LYMAN).

Amphiura urtica LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 195.
Amphiodia urtica VERRILL, 1899. Trans. Conn. acad., **10**, p. 313. H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 154, f. 64.

18 specimens. Alaska: Shumagin Islands, Nagai, Sanborn Harbor. Off central California, 48 fms.

Species of Amphiodia not represented in the M. C. Z.

646. A. ANTARCTICA (LJUNGMAN), 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 315 (*Ophiophragmus*). Strait of Magellan.

647. A. ASSIMILIS (LÜTKEN and MORTENSEN), 1899. Mem. M. C. Z., **23**, p. 153, pl. 10, f. 5–7 (*Amphiura*). Between Cocos Island and Ecuador, 1823 fms.

648. A. BROCKI (DÖDERLEIN), 1896. Jena. denkschr., **8**, p. 286, pl. 15, f. 6, 6*a* (*Amphiura*). Torres Strait: Thursday Island.

649. A. CAULLERYI (KOEHLER), 1897. Ann. sci. nat. Zool., ser. 8., **4**, p. 330, pl. 7, f. 44, 45 (*Amphiura*). Ceylon: off Colombo, 593 fms. Southern India: off Kistna delta, 753 fms.

650. A. CRASSA (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 83, pl. 15, f. 1, 2 (*Amphiura*). Dutch East Indies: off Macassar, 250 fms. North of Halmaheira, 1273 fms.

651. A. ERECTA KOEHLER, 1914. Bull. 84 U. S. N. M., p. 67, pl. 6, f. 4–7. Off Cape Hatteras, 52 fms.

652. A. FISSA (LÜTKEN), 1869. Add. ad hist. Oph., pt. 3, p. 30, 98 (*Amphipholis*). "Amur."

653. A. FRIGIDA (KOEHLER), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 332, pl. 7, f. 46, 47 (*Amphiura*). Ceylon: off Colombo, 675 fms.

654. A. FUSCOALBA (BROCK), 1888. Zeits. f. wiss. zool., **47**, p. 485 (*Amphiura*). Amboina.

655. A. GRATA (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 85, pl. 18, f. 6; pl. 19, f. 7 (*Amphiura*). Dutch East Indies: Celebes, off Gulf of Boni, 643 fms.

656. A. GRISEA (LJUNGMAN), 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 313 (*Amphipholis*). Ecuador: Guayaquil.

657. A. LÜTKENI (LJUNGMAN), 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 636 (*Amphipholis*). KOEHLER, 1914. Bull. 84 U. S. N. M., pl. 6, f. 1, 2. Virgin Islands, Tortola, 10 fms.

658. A. LYMANI (Studer), 1885. Jahrb. wiss. anst. Hamburg, **2**, p. 163, pl. 2, f. 10*a*, 10*b* (*Amphiura*). Antarctica: South Georgia.

659. A. OCHROLEUCA (Brock), 1888. Zeit. f. wiss. zool., **47**, p. 484 (*Amphiura*). Koehler, 1904. Mem. Soc. zool. France, **17**, p. 63, f. 12, 13. Amboina.

660. A. OLIVACEA (Brock), 1888. Zeit. f. wiss. zool., **47**, p. 486 (*Amphiura*). Koehler, 1904. Mem. Soc. zool. France, **17**, p. 64, f. 14, 15. Amboina.

661. A. ÖRSTEDII (Lütken), 1856. Vid. med., p. 26 (*Amphiura*). Koehler, 1904. Mem. Soc. zool. France, **17**, p. 68, f. 21, 22. Costa Rica: west coast, Punta Arenas.

662. A. PULCHELLA (Lyman), 1869. Bull. M. C. Z., **1**, p. 337 (*Amphiura*). 1875. Illus. cat. M. C. Z., no. 8, pt. 2, pl. 5, f. 75. Strait of Florida, 39 fms.

663. A. REPOSITA (Koehler), 1905. Siboga-exp. Oph. litt., p. 40, pl. 4, f. 12, 13 (*Amphiura*). Dutch East Indies: Borneo, near Cape Mangkalibat, 6 fms.

664. A. SECURIGERA (Düben and Koren), 1846. Kongl. Vet.-akad. Handl. f. 1844, p. 236, pl. 6, f. 3–6 (*Ophiopeltis*). Baltic Sea.

665. A. SERVATA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 84, pl. 15, f. 6–8 (*Amphiura*). Dutch East Indies: Kei Islands, 312 fms.

Ophiocnida.

Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 133.

Type-species: *Ophiolepis hispida* LeConte, 1851. Proc. Acad. nat. sci. Phil., **5**, p. 318. Type designated by Verrill (1899. Trans. Conn. acad., **10**, p. 317).

666. O. AMPHACANTHA McClendon, 1909. Univ. Cal. Publ. Zool., **6**, p. 46, pl. 4, f. 24, 25.

1 specimen. California: southwest of Farallones Light, 60–68 fms.

667. O. ECHINATA (Ljungman).

Ophiophragmus echinatus Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 316.
Ophiocnida echinata Lyman, 1874. Bull. M. C. Z., **3**, p. 230, pl. 4, f. 22, 23.

4 specimens. Philippine Islands, 6–10 fms. Dutch East Indies: Java, northeast of Madura Island, 46 fms.

668. O. FILOGRANEA Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 20, f. 88, 89.

Holotype and 2 paratypes. Florida: Cedar Key.

669. O. HISPIDA (Leconte). Plate **9**, f. 1, 2.

Ophiolepis hispida Leconte, 1851. Proc. Acad. nat. sci. Phil., **5**, p. 318.
Ophiocnida hispida Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 133.

3 specimens. Panama.

670. O. LOVENI (Ljungman).

Ophiophragmus loveni Ljungman, 1866. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 165.
Ophiocnida loveni Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 21. Koehler, 1914. Bull. 84 U. S. N. M., pl. 5, f. 7, 8.

12 specimens, including 3 cotypes. Brazil: Rio Janeiro.

671. O. SCABRIUSCULA (LÜTKEN). Plate **9**, f. 3, 4.
Amphiura scabriuscula LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 118.
Ophiocnida scabriuscula LYMAN, 1865. Illus. cat. M. C. Z., no. 1, p. 135.

5 specimens. Florida: Miami; Biscayne Bay; Sombrero Key. West Indies. Brazil; Porto Seguro.

Species of Ophiocnida not represented in the M. C. Z.

672. O. SCABRA LYMAN, 1879. Bull. M. C. Z., **6**, p. 33, pl. 12, f. 344–346. Brazil: off Bahia, 1275 fms.

CTENAMPHIURA.

VERRILL, 1899. Trans. Conn. acad., **10**, p. 306.

Type-species: *Amphiura maxima* LYMAN, 1879. Bull. M. C. Z., **6**, p. 19. Monotypic.

673. C. MAXIMA (LYMAN).
Amphiura maxima LYMAN, 1879. Bull. M. C. Z., **6**, p. 19, pl. 11, f. 278–281.
Ctenamphiura maxima VERRILL, 1899. Trans. Conn. acad., **10**, p. 306.

1 COTYPE. Arafura Sea, just west of Torres Strait, 28 fms.

AMPHIOPLUS.

VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 25.

Type-species: *Amphiura tumida* LYMAN, 1878. Bull. M. C. Z., **5**, p. 225.

674. A. ABDITUS (VERRILL).
Amphipholis abdita VERRILL, 1871. Amer. journ. sci., ser. 3, **2**, p. 132.
Amphioplus abdita VERRILL, 1899. Trans. Conn. acad., **10**, p. 314. KOEHLER, 1907. Bull. sci., **41**, p. 11, f. 24, 25.

16 specimens. Massachusetts: Woods Hole, near Ram Island. Connecticut: Noank. Florida: Miami; near Cape Florida; off Marquesas Keys; off west coast, 42 fms.

675. A. ACANTHINUS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 168, f. 75.

9 specimens, including 8 PARATYPES (4 without disks). Japan: OFF EASTERN COAST, 110–259 fms.; Uraga Channel, 150 fms.

676. A. AGASSIZII VERRILL, 1899. Trans. Conn. acad., **10**, p. 315. LYMAN, 1883. Bull. M. C. Z., **10**, pl. 5, f. 64–66.

HOLOTYPE. OFF ST. LUCIA, 116 fms.

677. A. ANDREAE (LÜTKEN).

Amphipholis andreae LÜTKEN, 1872. Ov. Kongl. Danske vid. sels. Forh., p. 106, pl. 1, f. 1*a–c*.

1 specimen. "Rade d'Alepy" (Alleppi, southwestern India?).

678. A. ASTERICTUS, sp. nov. (ἀστήρικτος, not firmly fixed, uncertain). Plate 7, f. 9–11.

Disk 8 mm. in diameter; arms about 90 mm. long. Disk flat covered with a coat of rather coarse scales among which the primary plates are plainly visible; radial plates separated from central by a single row of scales; about 16–18 series between central plate and margin of disk and about 14–16 between the radial shields, across an interradius. Radial shields very long and narrow, 2 mm. long by .5 mm. wide, only slightly divergent and separated their entire length by a narrow series of scales. Upper arm-plates quadrilateral but distal margin much longer than proximal, and distal corners rounded; broadly in contact throughout. Interbrachial spaces below covered with a close coat of fine scaling. Oral shields pentagonal longer than wide, the two proximal sides longer than the distal. Adoral plates rather large, meeting within. Oral papillae four on a side, in a close series; subdental papillae thick and block-like; of the other three, the distalmost is largest and nearly equals the first under arm-plate. Succeeding under arm-plates squarish, pentagonal or even somewhat hexagonal, a trifle longer than wide, more or less in contact. Side arm-plates small, not meeting either above or below; each carries 3 slender, subequal, bluntly pointed arm-spines, as long as a joint and a half. Tentacle-scales 2, rather small. Color (dried from alcohol), very pale brownish, the disk more gray.

HOLOTYPE (M. C. Z. 1486). Japan: BAY OF YEDDO. E. S. Morse collection.

Mr. Lyman had laid this specimen aside with some sketches of structural details, and only the label "Amphiura." I am unable to find any species in the present genus with which it agrees well but as its various characters are so indistinctive, I am not at all sure it has never been described (hence the name). It is apparently very near *causata* Koehler from Borneo Bank, but that species, although much smaller, has 4 arm-spines on the basal arm joints. There are other slight differences but none of so great importance as this, and a good series of specimens may show the identity of the two species.

679. A. CONGENSIS (STUDER). Plate 8, f. 10–12.

Amphiura congensis STUDER, 1882. Abh. K.-Preus. akad. wiss. Berlin, p. 19.

1 COTYPE. OFF THE MOUTH OF THE CONGO RIVER.

680. A. CUNEATUS (LYMAN).

Amphiura cuneata LYMAN, 1878. Bull. M. C. Z., **5**, p. 225, pl. 2, f. 34–36.
Amphioplus cuneata VERRILL, 1899. Trans. Conn. acad., **10**, p. 314.

3 specimens, including HOLOTYPE and 1 PARATYPE. GULF OF MEXICO, 399 fms. Off Grenada, 370 fms.

681. A. CYRTACANTHUS, sp. nov. (*κυρτός*, bent + *ἄκανθα*, spine). Plate **7**, f. 14, 15.

Disk wanting and arms all broken, but judging from scars and estimating by proportions, it is probable the disk was 8–10 mm. in diameter and the arms 75–100 mm. long. Upper arm-plates transversely elliptical but not twice as wide as long; all in contact. Oral shields distinctly longer than wide, somewhat diamond-shaped with rounded angles, the proximal half wider than the distal; madreporite much larger than the others and more oval. Adoral plates rather small but just meeting within. Oral papillae 4 on a side, and the tentacle-scale of the first oral tentacle being nearly in the same plane, there is the appearance of 5 on a side; subdental papillae very large and thick; the others small and scale-like, the penultimate largest. Under arm-plates somewhat longer than wide, more or less in contact; distal margin with a shallow notch. Side arm-plates narrow and prominent but not meeting either above or below; each one carries a series of sharp spines, more or less abruptly bent at the tip (hence the name); on the basal joints there are 6 of these spines, of which the third or fourth (from above) is smallest, the lowest the longest; the number of spines soon drops to 5, at the middle of the arm there are only 4 and distally only three; as the number decreases, the spines become subequal; everywhere the longest spine greatly exceeds a joint. Tentacle-scales 2, but very small and the one on the under arm-plate is not infrequently wanting distally. Color (dried from alcohol), very pale brown.

HOLOTYPE (M. C. Z. 1489) PHILIPPINE ISLANDS. "Muddy sand and stones." Semper collection.

In spite of the loss of the disk, I have no hesitation in describing this specimen, since the hooked arm-spines form such an obvious distinguishing character.

682. A. DALEA (LYMAN).

Amphiura dalea LYMAN, 1879. Bull. M. C. Z., **6**, p. 27, pl. 12, f. 320–322.
Amphioplus dalea VERRILL, 1899. Trans. Conn. acad., **10**, p. 315.

4 specimens, including 2 COTYPES. OFF mouth of RIO DE LA PLATA, 2650 fms. Gulf of Panama, 1471 fms. Lower California: southwest from Magdalena Bay, 1760 fms.

683. A. DEPRESSUS (Ljungman).
Amphipholis depressa Ljungman, 1867. Öfv. Kong. Vet.-akad. Förh., **23**, p. 312.

5 specimens. Philippine Islands, 6–35 fms.

684. A. EXSECRATUS (Koehler).
Amphiura exsecrata Koehler, 1905. Siboga-exp. Oph. litt., p. 48, pl. 3, f. 7, 8.

1 specimen, diskless. Philippine Islands, 20–35 fms.

685. A. GENTILIS (Koehler).
Amphiura gentilis Koehler, 1904. Siboga-exp. Oph. mer prof., p. 86, pl. 16, f. 8, 9.

1 cotype. Dutch East Indies: north of ceram, 464 fms.

686. A. GLAUCUS (Lyman).
Amphiura glauca Lyman, 1879. Bull. M. C. Z., **6**, p. 29, pl. 12, f. 326–328.
Amphioplus glauca Verrill, 1899. Trans. Conn. acad., **10**, p. 315.

2 specimens, including 1 cotype. Japan: Sagami Sea, 150 fms.; off southern coast, 345 fms.

687. A. HEXACANTHUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 170.

2 paratypes, diskless. Off central California, 50 fms.

688. A. INCISUS (Lyman).
Amphiura incisa Lyman, 1883. Bull. M. C. Z., **10**, p. 250, pl. 5, f. 58–60.

Holotype. Off Guadeloupe, 583 fms.

689. A. LAEVIS (Lyman).
Amphiura laevis Lyman, 1874. Bull. M. C. Z., **3**, p. 229, pl. 4, f. 18–21.
Amphioplus laevis Verrill, 1899. Trans. Conn. acad., **10**, p. 315.

Holotype and 7 paratypes. Philippine Islands, 6–35 fms.

690. A. LOBATODES, sp. nov. (λοβατώδης, like the lobed one, i. e. *lobata*). Plate **7**, f. 12, 13.

Disk, 9 mm. in diameter; arms about 55–60 mm. long. Very similar to *lobata* Ljungman from Sydney, N. S. W. (hence the name), but different in a few details. The upper arm-plates are more quadrilateral than elliptical and are only twice as wide as long. The arm-spines are 3 or 4 as a rule, 5 on a few basal joints, while in *lobata* there are 6 in a specimen only two thirds as large as the type of *lobatodes*. Color (dried from alcohol):—disk, pale gray; arms nearly white.

Holotype (M. C. Z. 1480) and 8 paratypes (M. C. Z. 1481, 1482, 1542, 1544). Japan: Uraga Channel, 150 fms.; Sagami Sea; mouth of the Bay of Yeddo.

In view of the fact that I know *lobata* only from Ljungman's Latin diagnosis,

it has not seemed proper to identify these specimens with that Australian species. On the other hand there is no other species to which I can so well refer them. The specimen from Yeddo Bay was examined by Mr. Lyman, who made a few hasty sketches of certain details and laid the specimen by with only the label "Amphiura." The other specimens have come into the collection more recently from the well-known Yokohama dealer, Mr. Alan Owston.

691. A. MACILENTUS (VERRILL). Plate **8**, f. 1, 2.
Amphiura macilenta VERRILL, 1882. Amer. journ. sci., ser. 3, **23**, p. 142.
Amphioplus macilenta VERRILL, 1899. Trans. Conn. acad., **10**, p. 314.

88 specimens, including 40 COTYPES. OFF MARTHAS VINEYARD, 63 fms. Off No Man's Land, 65 fms.

692. A. MEGAPOMUS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 170.

4 specimens, including 1 diskless PARATYPE. Japan: OFF EASTERN COAST, 37 fms.; mouth of Bay of Yeddo.

As this species was described from a diskless specimen, and no figures were given, it may be added here that the disk is covered with a coat of scales, about 16–18 series between center and margin and about 12–14 across an interradial area between the radial shields; the interbrachial areas below are also covered with very fine scales and where these meet the scaling of the upper surface there is a sharp margin. Radial shields short and wide, 1.2 mm. by .7, closely joined except at inner end.

These specimens from the mouth of the Bay of Yeddo are evidently smaller than the types of *megapomus* but they have the characteristic big tentacle-scales, the long oral shields and only 3 arm-spines. The upper and under arm-plates are not in perfect agreement with those of the larger specimen, but the differences do not seem to be more than should be expected.

693. A. NEREIS (LYMAN).
Amphiura nereis LYMAN, 1883. Bull. M. C. Z., **10**, p. 250, pl. 5, f. 61–63.
Amphioplus nereis VERRILL, 1899. Trans. Conn. acad., **10**, p. 314.

HOLOTYPE. OFF MONTSERRAT, 148 fms.

694. A. NOTACANTHUS (LÜTKEN and MORTENSEN).
Amphiura notacantha LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 158, pl. 13, f. 7–9.

1 specimen, diskless. Gulf of Panama, 1020 fms.

695. A. PARVICLYPEUS, sp. nov. (*parvus*, small + *clypeus*, shield). Plate **7**, f. 5–8.

Disk, 10 mm. in diameter; arms 60–70 mm. long. Disk with big inter-

radial lobes and closely covered with a coat of small, but not delicate scales; there are about 30 series from center to interradial margin, about 14–16 across an interradial area, between the proximal ends of the radial shields and about 30 series across an interradial lobe. Radial shields very small (hence the name), 1 mm. long by .25–.30 mm. wide, parallel, near together but separated by a thin line of scales. Upper arm-plates short and wide, and in contact for the full width, which is about 3 times the length. Interbrachial areas below with a firm coat of very minute scales. Oral shields lens-shaped, nearly twice as long as wide. Adoral plates of moderate size, meeting within. Oral papillae, 4 or 5 on a side, small and not at all distinctive. Under arm-plates nearly rectangular, wider than long (often very much so), in full contact. Side arm-plates low and not significant; each carries, 3, 4 or 5 short (scarcely equal to joint), subequal, not slender, blunt arm-spines; only on the basal part of the arm are more than 3 spines present in a series, and only on two or three joints, of each arm, are there five. Tentacle-scales 2, very large, nearly or quite equalling those of *megapomus*. Color in life: — pale fawn-color with patches of orange-brown, arms whitish; (dried from alcohol), pale grayish yellow.

HOLOTYPE (M. C. Z. no. 3742). Torres Strait: BADU. Nov. 1, 1913. Carnegie exp. 1913. F. A. Potts coll.

Although this specimen shed its disk after capture, it is practically uninjured for descriptive purposes. It was taken on the under side of a coral fragment in 5–6 feet of water. It is readily distinguishable from all other species of the genus by the exceedingly small radial shields.

696. A. PATULUS (LYMAN).
Amphiura patula LYMAN, 1879. Bull. M. C. Z., **6**, p. 31, pl. 12, f. 335–337.
Amphioplus patula VERRILL, 1899. Trans. Conn. acad., **10**, p. 315.

1 COTYPE. ANTARCTIC OCEAN, SOUTHWEST OF AUSTRALIA, 1975 fms.

697. A. RELICTUS (KOEHLER).
Amphiura relicta KOEHLER, 1898. Bull. sci., **31**, p. 68, pl. 4, f. 37, 38.[1]

2 specimens. Amboina. Torres Strait: off Goode Island, 2–3 fms.

698. A. RHADINOBRACHIUS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 167, f. 74.

5 specimens, including 1 PARATYPE. Japan: SAGAMI SEA, 200–405 fms.

[1] This seems to be identical with *Ophiophragmus affinis* Duncan, 1886, which is clearly an Amphioplus; but as Duncan's name cannot be used, since it is preoccupied by Studer's (see no. 701), Koehler's name is to be retained.

699. A. TUMIDUS (LYMAN).
Amphiura tumida LYMAN, 1878. Bull. M. C. Z., **5**, p. 225, pl. 2, f. 28–30.
Amphioplus tumida VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 25.

5 specimens, including HOLOTYPE and 2 PARATYPES. GULF OF MEXICO, 321 fms. Off Dominica, 94 fms. Off Grenada, 154 fms.

700. A. VERRILLI (LYMAN).
Amphiura verrilli LYMAN, 1879. Bull. M. C. Z., **6**, p. 29, pl. 12, f. 329–331.
Amphioplus verrillii VERRILL, 1899. Trans. Conn. acad., **10**, p. 314.

1 specimen. Off St. Vincent, 424 fms.

Species of Amphioplus not represented in the M. C. Z.

701. A. AFFINIS (STUDER), 1885. Jahrb. wiss. anst. Hamburg, **2**, p. 162, pl. 2, f. 9*a–b* (*Amphiura*). Antarctica: South Georgia.

702. A. BASILICUS (KOEHLER), 1907. Bull. sci., **41**, p. 307, pl. 11, f. 17, 18 (*Amphiura*). New Zealand: East Cape.

703. A. CAPAX (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 50, pl. 6, f. 1, 2 (*Amphiura*). Dutch East Indies: Ceram Laut, Gisser, 10 fms.

704. A. CAUSATUS (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 49, pl. 5, f. 5, 6 (*Amphiura*). Dutch East Indies: Strait of Macassar, Borneo Bank, 33 fms.; off Waigeu, 46 fms.

705. A CERNUUS (LYMAN), 1879. Bull. M. C. Z., **6**, p. 28, pl. 12, f. 323–325 (*Amphiura*). North Pacific Ocean: east from Japan, 2300 fms.

706. A. CESAREUS (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 44, pl. 5, f. 1, 2 (*Amphiura*). Dutch East Indies: ten stations, 15–50 fms.

707. A. CONDITUS (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 46, pl. 5, f. 9, 10 (*Amphiura*). Dutch East Indies: Borneo, off Cape Mangkalihat, 6 fms.

708. A. CONFINIS (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 89, pl. 14, f. 7, 8 (*Amphiura*). Dutch East Indies: Celebes, off Gulf of Boni, 643 fms.

709. A. CONSORS (KOEHLER), 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh. **46**, pl. 13, f. 117, 118 (*Amphiura*). Antarctic Ocean, south of Atlantic, 2620 fms.

710. A. DEBILIS (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 88, pl. 14, f. 5, 6 (*Amphiura*). Dutch East Indies: Celebes, off Gulf of Boni, 643 fms.

711. A. DIFFICILIS (DUNCAN), 1887. Journ. Linn. soc. Zool., **21**, p. 90, pl. 8, f. 7–9 (*Ophiophragmus*). Mergui Archipelago.

712. A. DISPAR (KOEHLER), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 334, pl. 7, f. 48, 49 (*Amphiura*), Bay of Bengal, Laccadive Islands and near Ceylon, 193–675 fms.

713. A. FAMULA (KOEHLER), 1910. Records Indian mus., **5**, p. 85, pl. 5, f. 3, 4 (*Amphiura*). Burma: south from Cape Negrais, 643 fms.

714. A. FIRMUS (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 87, pl. 12, f. 7, 8 (*Amphiura*). Halmaheira Sea, north of Kofiau, 227 fms.

715. A. FORMATUS (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 51, pl. 5, f. 11–13 (*Amphiura*). Dutch East Indies: north coast of Sumbawa.

716. A. GASTRACANTHUS (LÜTKEN and MORTENSEN), 1899. Mem. M. C. Z., **23**, p. 156, pl. 13, f. 4–6 (*Amphiura*). Mexico: off Acapulco, 660 fms.

717. A. GIBBOSUS (LJUNGMAN), 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 316 (*Ophiophragmus*). Natal: near Port Natal.

718. A. HASTATUS (LJUNGMAN), 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 313 (*Amphipholis*). Mozambique.

719. A. IMPRESSUS (Ljungman), 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 314 (*Amphipholis*). Deep water between Singapore and Batavia.

720. A. INTEGER (Ljungman), 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 313 (*Amphipholis*). Koehler, 1904. Mem. Soc. zool. France, **17**, p. 65, f. 16, 17 (*Amphiura*). Natal: near Port Natal.

721. A. INTERMEDIUS (Koehler), 1905. Siboga-exp. Oph. litt., p. 42, pl. 4, f. 14, 15 (*Amphiura*). Java: Djangkar, 5 fms. Dutch East Indies: Strait of Macassar, Borneo Bank, 33 fms.

722. A. LOBATUS (Ljungman), 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 315 (*Amphipholis*). New South Wales: Sydney.

723. A. LORIOLI (Koehler), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 328, pl. 7, f. 42, 43 (*Ophiactis*). Bay of Bengal, Laccadive Islands and Malabar Coast, 1091–1300 fms.

724. A. MAGNIFICUS (Koehler), 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, pl. 12, f. 111; pl. 13, f. 119 (*Amphiura*). Antarctic Ocean, south of Atlantic, 2103–2620 fms.

725. A. MODESTUS (Koehler), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 340, pl. 7, f. 54, 55 (*Ophiochiton*). Andaman Islands, 265 fms.

726. A. PAPILLATUS (Lütken and Mortensen), 1899. Mem. M. C. Z., **23**, p. 159, pl. 14, f. 4–6 (*Amphiura*). Galapagos Islands, 385 fms.

727. A. PEREGRINATOR (Koehler), 1912. Charcot exp. Ech., p. 135, pl. 11, f. 5, 11, 12 (*Amphiura*). West Antarctica: Roosen Canal, 40 fms.

728. A. PERSONATUS (Koehler), 1905. Siboga-exp. Oph. litt., p. 47, pl. 5, f. 7, 8 (*Amphiura*). Dutch East Indies: Flores, Badjo Bay.

729. A. PRAESTANS (Koehler), 1905. Siboga-exp. Oph. litt., p. 45, pl. 4, f. 16, 17 (*Amphiura*). Dutch East Indies: Celebes, Macassar; Buton; Lombok; Sumbawa.

730. A. REFECTUS (Koehler), 1905. Siboga-exp. Oph. litt., p. 52, pl. 6, f. 3, 4 (*Amphiura*). Sula Besi Island, Sanang Bay.

731. A. RESECTUS (Koehler), 1911. Ann. Inst. Ocean., **2**, fasc. 5, p. 16, pl. 2, f. 10–12 (*Amphiura*). French Guinea: Konakry; Los Islands.

732. A. SPINULOSUS (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 92, pl. 17, f. 7, 8 (*Amphiura*). Dutch East Indies: between Flores and Solor, 137 fms.

733. A. TESSELLATUS (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 89, pl. 13, f. 8, 9 (*Amphiura*). Dutch East Indies: off Rotti, 520 fms.

734. A. TEXTILIS (Koehler), 1907. Bull. sci., **41**, p. 309, pl. 12, f. 34, 35 (*Amphiura*). Tierra del Fuego: Orange Bay.

735. A. TREPIDUS (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 93, pl. 14, f. 1, 2 (*Amphiura*). Dutch East Indies: south of Kangeang Island, 160 fms.

Amphilimna.

Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 30.

Type-species: *Ophiocnida olivacea* Lyman, 1869. Bull. M. C. Z., **1**, p. 340. Type designated.

736. A. OLIVACEA (Lyman).

Ophiocnida olivacea Lyman, 1869. Bull. M. C. Z., **1**, p. 340. 1871. Illus. cat. M. C. Z., no. 6, pl. 1, f. 7, 8.

Amphilimna olivacea Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 30.

30 specimens, including HOLOTYPE and 2 PARATYPES. Off Marthas Vineyard, 129 fms. Off Newport, R. I., 65–192 fms. Florida: off Sombrero Key, 74 fms.; OFF ALLIGATOR REEF, 79 fms.; off Florida reefs, 100–120 fms. Cuba: off Havana, 119 fms. Off southern Brazil, 70 fms.

737. A. PENTACANTHA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 172, f. 77.

10 PARATYPES. OFF CENTRAL CALIFORNIA, 48 fms.

Species of Amphilimna not represented in the M. C. Z.

738. A. CARIBEA (LJUNGMAN), 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 636 (*Ophiocnida* ?). Off Anguilla, 300–400 fms.

739. A. LIBERA (KOEHLER), 1907. Bull. sci., **41**, p. 312, pl. 11, f. 22, 23 (*Ophiocnida*). Cape Verde Islands: St. Vincent.

740. A. SEXRADIA (DUNCAN), 1887. Journ. Linn. soc. Zool., **21**, p. 92, pl. 8, f. 10, 11 (*Ophiocnida*). Mergui Archipelago: Owen Island.

OPHIOPUS.

LJUNGMAN, 1867. Öfv. Kongl. Vet-akad. Förh., **23**, p. 309.

Type-species: *Ophiopus arcticus* LJUNGMAN, 1867. *loc. cit.* Monotypic.

741. O. ARCTICUS LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 309. GRIEG, 1893. Norw. North Atl. exp. Oph., pl. 2, f. 13, 14.

6 specimens. SPITZBERGEN: north coast, 555 fms.; Prince Charles Land, 58 fms. Norway: Vadsö, 60–100 fms. Baffin's Bay, 183 fms.

OPHIACTIS.

LÜTKEN, 1856. Vid. med., p. 12.

Type-species: *Ophiactis krebsii* LÜTKEN, 1856. *loc. cit.* = *O. savignyi* (M. & T.). Here first definitely designated.

742. O. ABYSSICOLA (SARS).

Amphiura abyssicola SARS, 1861. Ov. Norges Ech., p. 18, pl. 2, f. 7–12.
Ophiactis abyssicola LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 324.

47 specimens. Norway. Southwest of Iceland, 799 fms. East of Shetland Islands, 203 fms. Faroe Channel, 440 fms. Off southwestern Ireland, 610–680 fms.

743. O. ARENOSA LÜTKEN, 1856. Vid. med., p. 25. MCCLENDON, 1909. Univ. Cal. publ. Zool., **6**, p. 42, pl. 3, f. 16, 17.

1 specimen. California: San Diego.

744. O. ASPERULA (PHILIPPI). Plate **10**, f. 11, 12.

Ophiolepis asperula PHILIPPI, 1858. Arch. naturg., **24**, 1, p. 267.
Ophiactis asperula LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 130.

411 specimens, including 2 COTYPES. Patagonia: Bahia Blanca, 44 fms.; Gulf of San Matias; Port Gallant; Eden Harbor; Sancta Magdalena; Conner Cove; Puerto Bueno; Sandy Point. Strait of Magellan, 5 fms. CHILE.

745. O. BALLII (THOMPSON).

Ophiocoma ballii THOMPSON, 1840. Ann. nat. hist., **5**, p. 99.
Ophiactis ballii LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 126. SARS, 1861. Ov. Norges Ech., pl. 2, f. 1–6 (as *Amphiura ballii*).

14 specimens. Sweden: Bohuslän. Norway[1]: Trondhjeim Fjord. France: "Cape Breton" (possibly Bretagne), 28 fms.

746. O. BRACHYGENYS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 135, f. 51.

1 PARATYPE. Japan: Bungo Channel, 437 fms.

747. O. CANESCENS (LYMAN).

Amphiura canescens LYMAN, 1879. Bull. M. C. Z., **6**, p. 30, pl. 12, f. 332–334.
Ophiactis canescens LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 143.

1 COTYPE. NORTH OF KERMADEC ISLANDS, 600 fms.

748. O. CANOTIA LYMAN, 1879. Bull. M. C. Z., **6**, p. 40, pl. 13, f. 353–355.

1 COTYPE. NEAR THE AZORES, 1000 fms.

749. O. CARNEA LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 324.

1 specimen. Cape Colony: Simon's Bay, 10–20 fms.

750. O. CUSPIDATA LYMAN, 1879. Bull. M. C. Z., **6**, p. 38, pl. 13, f. 359–361.

2 COTYPES. NEAR KERMADEC ISLANDS, 520 fms.

751. O. DELICATA, sp. nov. Plate **11**, f. 9, 10.

Disk 2 mm. in diameter; arms 6, each about 13 mm. long. Disk covered by coarse flat scales, only 4 or 5 series between center and margin and only 2 series, between radial shields across an interradius; near margin, a few scales bear spinelets. Radial shields moderately large, triangular, the outer sides parallel, hence the inner margins diverge, though the shields are in contact distally. Upper arm-plates fan-shaped, or triangular, truncate proximally and with rounded distal corners; more or less in contact throughout. Interbrachial areas below covered with coarse scales, many of which carry, each a small spinelet. Oral shields pentagonal, with rounded corners, about as broad as long. Adoral plates large, forming a practically complete ring proximal to oral shields and distal to first under arm-plates, but the plates are not actually in close contact in every radius and interradius. Oral papillae, two on each jaw, one on the inner end of each adoral plate; it is fan-shaped and relatively large. Lower arm-plates pentagonal, about as long as wide, with distal corners rounded and

[1] Without definite locality.

distal end wider than proximal; more or less in contact. Side arm-plates rather small but each carries 4 arm-spines (distally only 3); these are short, thick, blunt and subequal. Tentacle-scale 1, relatively large. Colors in life, orange and brown; dried (from formalin-corrosive-sublimate solution), disk variegated dull reddish purple and dull, very pale yellow; each radial shield is dark with a conspicuous light spot at distal end; arms light with a broad mid-dorsal stripe of dull purplish, which fades out completely on distal half of arm, but proximally expands on every other upper arm-plate (or on two consecutive plates sometimes) to form an indefinite band around the arm; oral surface and arm-spines light, but many of the spines have a narrow band of purplish around them near the middle.

HOLOTYPE (M. C. Z. 3729). Torres Strait: Murray Island, MER, off southwestern reef, 18 fms. Carnegie Exp. 1913. H. L. Clark coll. Found on a comatulid (*Comanthus annulatum*) and apparently commensal, since it was on the comatulid when the latter was taken from the sea.

Although it is probable that this specimen is young, it seems to be well characterized by the combination of a single large, oral papilla, four arm-spines and adoral plates forming a ring. The coloration is also different from that of any Ophiactis heretofore described.

752. O. DUPLICATA (LYMAN).

Amphiura duplicata LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 19, f. 87, pl. 5, f. 78.
Ophiactis duplicata LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 142, pl. 6, f. 1–3.

71 specimens, including HOLOTYPE and 3 PARATYPES. Gulf of Panama: southeast of Malpelo Island, 899 fms. Gulf of Mexico, 220–539 fms. Off St. Cruz, D. W. I., 115–508 fms. Off St. Kitts, 208–250 fms. Off Nevis, 356 fms. Off Montserrat, 88–298 fms. Off Guadeloupe, 175–734 fms. Off Dominica, 333–390 fms. Off Martinique, 170–476 fms. Off St. Lucia, 116–423 fms. Off St. Vincent, 573 fms. Off the Grenadines, 338 fms. Off Cannouan, 127 fms. Off Carriacou, 163 fms. Off Grenada, 291–416 fms. OFF BARBADOS, 73–218 fms. Brazil?

753. O. FLEXUOSA LYMAN, 1879. Bull. M. C. Z., **6**, p. 37, pl. 13, f. 347–349.

2 specimens, including a COTYPE and a cotype of var. *perplexa* Koehler. NEAR KERMADEC ISLANDS, 600 fms. Dutch East Indies: east of Ceram, 315 fms.

754. O. GYMNOCHORA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 139, f. 54.

1 COTYPE. Japan: TANEGASIMA.

755. O. HEMITELES, sp. nov. (ἡμιτελής, half-finished). Plate 10, f. 7, 8.

Disk 5 mm. in diameter; arms all broken but evidently long and probably exceeding 40 mm. Disk covered with a coat of rather fine scales, which extend barely to the margin; the interbrachial areas below are covered by naked skin with here and there minute plates carrying, each, a single, low, sharp spinelet; a few of these spinelets may be found just above the margin of the disk. Radial shields about 1 mm. long, and scarcely .5 mm. wide, in contact distally but separated within. Upper arm-plates, at first somewhat oval and about as long as wide but rapidly becoming elliptical and much wider than long, broadly in contact. Oral shields, except madreporite, elliptical, nearly twice as wide as long; madreporite rounded pentagonal, almost as long as broad. Adoral plates relatively large, meeting within and also nearly or quite meeting in the mid-radial line; they are 2 or 3 times as long as wide. Oral papillae 2 on each side, small and scale-like; the proximal one is on the oral plate, the distal one on the inner end of the adoral plate. Under arm-plates octagonal with slightly rounded angles, a trifle wider than long, broadly in contact. Side arm-plates low and small; each carries a series of 7 or 8 small, crowded, sharp spines; the third or fourth from the top is longest and equals the joint, the others, especially the lower ones are much smaller. Tentacle-scale 1, large and oval. Color of dried specimen, which has not been in alcohol: — disk skin very dark brown but scales and radial shields nearly white; proximal ends of radial shields and some marks on disk, dark brown; arms pale reddish buff with every third or fourth upper arm-plate (sometimes two together) dark brown with a light spot at center; oral surface uniformly light.

Holotype (M. C. Z. 3739). Torres Strait: Murray Islands, Mer, southwestern reef. Oct. 1913. Carnegie Exp. 1913. H. L. Clark coll.

This specimen had all the appearance in life of an amphiuran and it was a surprise to discover it an Ophiactis. The remarkably long arms, the numerous and delicate arm-spines and the large amount of naked skin in the interradial areas, giving an unfinished appearance to the body (hence the name), easily distinguish this species from any Ophiactis hitherto described.

756. O. KRÖYERI Lütken, 1856. Vid. med., p. 24, 1859. Add. ad hist. Oph., pt. 2, pl. 3, f. 8*a–c*.

184 specimens, including 1 cotype of *Ophiolepis atacamensis* Philippi and 4 cotypes of *Ophiactis fragilis* Ljungman. Hawaii: Honolulu. Peru: Payta; Ancon Bay; Callao; Pisco Bay; Paraca Bay. Chile: Atacama, Isle Blanco; Caldera; Talcahuano.

757. O. LORICATA Lyman, 1869. Bull. M. C. Z., **1**, p. 331. Plate **10**, f. 3, 4.

Holotype and 2 paratypes. Florida: off Alligator Reef, 110 fms.

758. O. LUTEOMACULATA, sp. nov. (*luteus*, yellow + *maculatus*, having spots). Plate **11**, f. 7, 8.

Disk 3.5 mm. in diameter; arms 10 mm. long. Disk covered by the compact group of 6 primary plates, about 15 other large plates, some 25 small, more or less triangular plates (space-fillers between the large ones), and the radial shields. The latter are triangular, .75 mm. long by .40 mm. broad at the distal end where they are in contact. None of the disk-plates bear spinelets but in the interradial areas, the finer scaling which covers the lower surface is plainly visible and some of those scales, especially where they help form the disk-margin, carry stout, blunt little spines. Upper arm-plates large, fan-shaped, only slightly in contact. Oral shields rather large, rounded pentagonal, much wider than long. Adoral plates relatively big, short, and wide, meeting in the mid-radial line but widely separated proximal to oral shield. Oral papillae large, scale-like, one on the inner end of each adoral plate. Under arm-plates bell-shaped, about as long as wide, wider distally than proximally, only the basal ones in contact. Side arm-plates rather conspicuous, meeting below (outside of disk), and nearly meeting above; each carries 3 (rarely 4) short, thick, blunt arm-spines, the uppermost, the longest and about equal to a joint. Tentacle-scale, 1, large, oval. Color (dried specimen, never in alcohol), greenish white, clouded with dull olive-green; radial shields dull yellowish; arms indistinctly banded, greenish white and dull olive. In life, the green shades were much brighter and the radial shields were bright orange-yellow (hence the name).

Holotype (M. C. Z. 3730). Torres Strait: Murray Islands, Mer, off southwestern reef, 18 fms., on a sponge. Oct. 13, 1913. Carnegie Exp., 1913. H. L. Clark coll.

The short arms, large smooth disk scales, fan-shaped upper arm-plates, single oral papillae and peculiar adoral plates make a combination of characters which readily distinguish this species. The color is also probably distinctive but it is doubtful if it would be preserved in alcoholic specimens.

759. O. MACULOSA von Martens, 1870. Arch. naturg., **36**, 1, p. 248. Plate **11**, f. 3, 4.

18 specimens. Philippine Islands.

760. O. MÜLLERI Lütken, 1856. Vid. med., p. 12. Plate **11**, f. 5, 6.

37 specimens. South Carolina: Charleston. Florida: west of Tortugas, 37 fms.; off Garden Key, 8–15 fms.; off Turtle Harbor, 12 fms. Off St.

Bartholomew. St. Cruz, D. W. I., Flannegans Passage, 27 fms. Off Barbados, 69–76 fms. Brazil: off the Abrohlos, 30 fms.

761. O. NOMENTIS Farquhar, 1907. Trans. N. Z. inst., **39**, p. 125. Plate **11**, f. 1, 2.

2 cotypes. New Zealand: Cape Maria van Dieman.

762. O. PLANA Lyman, 1869. Bull. M. C. Z., **1**, p. 330. Plate **10**, f. 1, 2.

8 specimens, including holotype and 3 paratypes. Bermuda: Fairyland Bay. North Carolina: off Cape Fear River bar. Off Georgia, 225 fms. Florida: off Carysfort Reef, 117 fms.; Key West, off the Tortugas. Gulf of Mexico, 26 fms.

763. O. POA Lyman, 1879. Bull. M. C. Z., **6**, p. 40, pl. 13, f. 356–358.

3 cotypes. off Tristan d'Acunha, 500 fms.

764. O. PROFUNDI Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 140, pl. 6, f. 4–6.

2 cotypes. Gulf of Panama: southeast of Malpelo Island, 899 fms.

765. O. PTEROPOMA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 134, f. 50.

25 specimens, including 2 paratypes. Japan: off Hiro Misaki Light, 191 fms.; Uraga Channel, about 200 fms.

766. O. QUADRISPINA, sp. nov. Plate **10**, f. 9, 10.

Disk 7 mm. in diameter; arms 30–35 mm. long. Disk covered with scales, which are large and circular at center of disk but become much smaller at the margin, where a few of them bear, each a minute spinelet; interbrachial areas below nearly bare, the dark colored thin skin carrying only minute, widely scattered plates each of which bears a correspondingly minute spinelet. Radial shields 1.8 mm. long by .8 mm. wide, slightly curved, nearly or quite parallel, not in contact except distally in some cases. Upper arm-plates exceedingly short and wide, very broadly in contact; near middle of arm, they are 1.75 mm. wide and only .40 mm. long. Oral shields bud-shaped, with a notable stem-like projection into the interradial area; except for this stem, the length and breadth are about equal. Adoral plates small, confined to the sides of the oral shields but meeting very plainly in the mid-radial line. Oral papillae single, scale-like on the inner end of the adoral plate. Under arm-plates hexagonal with rounded angles, wider than long, broadly in contact, at least the basal ones with slightly thickened margins. Side arm-plates small; each carries a series of 4 short, thick, blunt arm-spines (hence the name) of which the uppermost is longest and about

equals or is less than the joint; on two or three basal joints there may be 5 (on one joint 6) spines, and then the longest is the third or fourth from the top; distally there are 4 spines nearly to tip of arm. Tentacle-scale 1, big and round. Color (dried from alcohol), dull yellowish brown.

HOLOTYPE (M. C. Z. 1225) and 1 PARATYPE (M. C. Z. 3926). PHILIPPINE ISLANDS, 6–35 fms. Semper collection, no. 36.

Mr. Lyman had labeled these specimens "Amphiuroid = Ophiactis!" but left no notes or sketches with them. The smaller specimen is only 4 mm. across the disk but the arms are about 30 mm. long. The upper arm-plates are not as excessively short as in the larger individual but in other details the specimens agree well. Even in this smaller specimen, there are 4 arm-spines on each side arm-plate nearly to tip of arm. This marked uniformity in the number of arm-spines, combined with the naked skin of the lower surface of disk, the shape of the arm-plates and the peculiar oral shields and adoral plates, serve to distinguish this species even in this perplexing genus.

767. O. RESILIENS LYMAN, 1879. Bull. M. C. Z., **6**, p. 36, pl. 13, f. 362–364.

18 specimens. New South Wales: off Coogee, 49–50 fms.; Jervis Bay, 10–11 fms.; Port Jackson, 1–10 fms. Australia: Bass Strait.

768. O. SAVIGNYI (MÜLLER and TROSCHEL).

Ophiolepis savignyi MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 95.
Ophiactis savignyi LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 323. LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, pl. 3, f. 7*a–b* (as *O. reinhardtii*).

1797 specimens, including 1 cotype of *Ophiactis incisa* von Martens. Zanzibar. Mauritius. Ceylon. Singapore. Philippine Islands [1]: Cebu, Bantayan Reef. Pelew Islands. Torres Strait: Badu; Thursday Island; Friday Island; Erub; Murray Islands, Mer. Fiji Islands: Viwa. Society Islands. Hawaiian Islands [1]: Oahu, Pearl Harbor. California: San Diego. Lower California: Cape St. Lucas. Mexico: Mazatlan. Panama: Pearl Islands. Florida [1]: west of Tortugas, 37 fms.; Key West; Cape Florida; Miami. Bahamas. Jamaica: Montego Bay; Port Henderson; Port Royal. West Indies [1]: St. Cruz, D. W. I., Flannegan's Passage, 27 fms. St. Thomas, D. W. I. Bermuda [1]: Harrington Sound.

769. O. SIMPLEX (LECONTE). Plate **10**, f. 5, 6.

Ophiolepis simplex LECONTE, 1851. Proc. Acad. nat. sci. Phil., **5**, p. 318.
Ophiactis simplex LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 130.

2 specimens, including 1 COTYPE. PANAMA. Mexico: Magdalena Bay.

[1] Without definite locality.

770. O. VIRENS (SARS), 1857.

Amphiura (Ophiactis) virens SARS, 1857. Nyt mag. naturvid., **10**, p. 39.
Ophiactis virens LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 126. Simroth, 1876. Zeits. f. wiss. zool., **27**, pl. 31, f. 1–4.

148 specimens. NAPLES.

Species of Ophiactis not represented in the M. C. Z.

771. O. AFFINIS DUNCAN, 1879. Journ. Linn. soc. Zool., **14**, p. 469, pl. 10, f. 23; pl. 11, f. 24. Korean Seas.

772. O. AFRICANA KOEHLER, 1911. Ann. Inst. ocean., **2**, fasc. 5, p. 17, pl. 3, f. 4, 5. Mauritiana: Levrier Bay. Congo Free State: Banana.

773. O. BRACHYASPIS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 138, f. 53. Loc.?

774. O. BRACHYURA DÖDERLEIN, 1898. Jena. denkschr., **8**, p. 485, pl. 37, f. 2, 2*a*. Amboina.

775. O. BROCKI DE LORIOL, 1893. Rev. Suisse zool., **1**, p. 401, pl. 14, f. 1–1*e*. Amboina.

776. O. CONFERTA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 25, pl. 3, f. 15–17. Dutch East Indies: Salawatti, 10 fms.

777. O. CORALLICOLA KOEHLER, 1895. Rev. biol. Nord France, **7**, p. 24, f. 5. 1909. Princesse-Alice Echinod., pl. 1, f. 11, pl. 7, f. 4, 5 (colored). Bay of Biscay, 528–945 fms.

778. O. DISPAR VERRILL, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 31, pl. 7, f. 3–3*c*. Bahama Banks, shallow water.

779. O. DISSIDENS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 98, pl. 17, f. 10; pl. 18, f. 7. Dutch East Indies: Strait of Macassar, 723 fms.

780. O. DYSCRITA, H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 137, f. 52. Japan: Kagoshima Gulf, 58 fms.

781. O. ECHINATA KOEHLER, 1898. Hirondelle Ech. et Oph., p. 48, pl. 5, f. 15, 16. Near the Azores, 445 fms.

782. O. HIRTA LYMAN, 1879. Bull. M. C. Z., **6**, p. 39, pl. 13, f. 365–367. New South Wales: off Sydney, 400 fms.

783. O. LJUNGMANI MARKTANNER-TURNERETSCHER, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 297, pl. 12, f. 9–11. Near Cape Verde Islands. Haiti: Port au Prince.

784. O. LONGIBRACHIA H. L. CLARK, 1901. Bull. U. S. F. C., **2**, p. 246, pl. 14, f. 1–5. Off Viequez Island, 6 fms.

785. O. LÜTKENI MARKTANNER-TURNERETSCHER, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 298, pl. 12, f. 7, 8. Fernando Po.

786. O. LYMANI LJUNGMAN, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 629. Virgin Islands: Salt Islands, 30–40 fms.

787. O. MACROLEPIDOTA MARKTANNER-TURNERETSCHER, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 298, pl. 12, f. 12, 13. New South Wales: Sydney.

788. O. MODESTA BROCK, 1888. Zeit. f. wiss. zool., **47**, p. 482. DÖDERLEIN, 1898. Jena. denkschr., **8**, pl. 15, f. 5–5*b*. Amboina.

789. O. NAMA LYMAN, 1879. Bull. M. C. Z., **6**, p. 38, pl. 13, f. 350–352. Kermadec and Fiji Islands, 210–610 fms.

790. O. NIGRESCENS HUTTON, 1872. Cat. N. Z. Ech., p. 2. New Zealand.

791. O. PARATA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 97, pl. 24, f. 3, 4. Dutch East Indies: off Waigeu, 261 fms.

792. O. PECTORALIS LYMAN, 1880. Anniv. mem. Boston soc. nat. hist., p. 10, pl. 2, f. 26–28. Dutch East Indies: northeast of Celebes, 500 fms.

793. O. PERPLEXA KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 327, pl. 7, f. 40, 41. Southern India: off Cape Comorin, 719 fms.

794. O. PICTETI (DE LORIOL), 1893. Rev. Suisse zool., **1**, p. 405, pl. 14, f. 2–2*f* (*Ophiocnida*). Amboina.

795. O. UMBONATA (MATSUMOTO), 1915. Proc. Acad. nat. sci. Phil., **67**, p. 67 (*Amphiactis*). Japan: Sagami Sea.

OPHIOPHOLIS.

MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 96.

Type-species: *Ophiolepis scolopendrica* MÜLLER and TROSCHEL = *Asterias aculeatus* RETZIUS, 1783, Ast. gen., p. 240. Type by elimination, the other two species included in Ophiopholis by Müller and Troschel having long since been transferred to other genera.

796. O. ACULEATA (RETZIUS).

Asterias aculeatus RETZIUS, 1783. Ast. gen., p. 240.

Ophiopholis aculeata GRAY, 1848. Rad. anim. Brit. mus., p. 25. LYMAN, 1865. Illus. cat. M. C. Z., **1**, pl. 1, f. 4–6, colored (*as O. bellis*). H. L. CLARK, 1904. Bull. U. S. F. C. for 1902, pl. 5, f. 24–27; pl. 7, f. 41, 42.

1600 specimens, including holotype and 2 paratypes of *caryi*, 1 cotype of *japonica* and 1 cotype of *kennerlyi*. Greenland. Iceland. Spitzbergen. Karahavet. Norway[1]: Bergen. Öresund. Kattegat. Scotland: Oban. Azores: Fayal. Labrador[1]: Caribou Island. Newfoundland. Strait of Belle Isle. Anticosti: Ellis Bay. Mingan Islands. Gulf of St. Lawrence, 50 fms. Nova Scotia: Halifax. New Brunswick: Grand Manan. Maine: Eastport; Trenton; Isle au Haut; Casco Bay, Broad Sound and Basin Point; Casco Bay, 8 fms.; Portland. Massachusetts: off Marblehead; Nahant; Phillips Beach; Boston; Massachusetts Bay; Provincetown; off Chatham, 17 fms. Off Georges Bank, 30–40 fms. South of Marthas Vineyard, 260 fms. Connecticut: Noank. Off New Jersey, 89 fms. Bering Sea, 33–270 fms. Off Bering Island, 72–76 fms. Off Alaskan Peninsula, 38–230 fms. Aleutian Islands: off Attu, 57–135 fms.; Agattu; off Agattu, 482 fms. Unalaska: off Unalaska, 280 fms. Alaska[1]: Iliuliuk; Killisnoo. Queen Charlotte Islands. Gulf of Georgia. Puget Sound[1]: Friday Harbor. Off Washington, 59 fms. California: Mendocino; San Francisco; 5 miles south of Santa Barbara. Kurile Islands: off Simushir, 229 fms. Okhotsk Sea, 64–73 fms. Sea of Japan, 86–190 fms. Japan: off Yokohama, 420–775 fms.; off Omai Saki Light, 505 fms.; Uraga Channel, 200 fms.

797. O. BAKERI MCCLENDON, 1909. Univ. Cal. publ. Zool., **6**, p. 41, pl. 5, f. 26, 27.

44 specimens. Off Oregon, 41–64 fms. Off California, 39–68 fms.

798. O. BRACHYACTIS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 117, f. 44.

19 specimens, including 13 PARATYPES. Japan: OFF EAST COAST, 153 fms.;

[1] Without definite locality.

URAGA CHANNEL, 180–197 fms.; OFF KAGOSHIMA GULF, 152 fms. EASTERN SEA, 181 fms. SEA OF JAPAN, 79 fms.

799. O. LONGISPINA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 119, f. 45.

13 PARATYPES. OFF WASHINGTON, 636–685 fms. OFF OREGON, 277 fms.

800. O. MIRABILIS (DUNCAN).
Ophiolepis mirabilis DUNCAN, 1879. Journ. Linn. soc. Zool., **14**, p. 460, pl. 9, f. 12; pl. 10, f. 13, 14.
Ophiopholis mirabilis LYMAN, 1879. Bull. M. C. Z., **6**, p. 43.

12 specimens. Japan [1]: Hakodate Bay, 11.5–15.5 fms.

Genera of Amphiuridae not represented in the M. C. Z.

PARAMPHIURA Koehler, 1895. Rev. biol. Nord France, **7**, p. 331 (17 of reprint).

801. Type-species: OPHIOCOMA PUNCTATA Forbes, 1841. British starfishes, p. 37, figs. KOEHLER, 1895. *loc. cit.*, pl. 9, f. 22, 23. North Sea: near Dogger Bank.

802. P. TRITONIS (HOYLE), 1884. Proc. Roy. soc. Edinb., **12**, p. 716, pl. 7, f. 1–3 (*Amphiura bellis* var. *tritonis*). Faroë Channel, 516 fms.

OPHIONEMA Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 27, 94, 98.

803. Type-species: O. INTRICATA LÜTKEN, 1869. *loc. cit.*, p. 27, f. 98. Monotypic. St. Thomas, D. W. I., 2 fms.

OPHIOCENTRUS Ljungman, 1867. Öfv. Kongl. Vet-akad. Förh., **23**, p. 321.

804. Type-species: O. ACULEATUS LJUNGMAN, 1867. *loc. cit.* Monotypic. Deep water between Batavia and Singapore.

OPHIOTRICHIDAE.

OPHIOTHRIX.

MÜLLER and TROSCHEL, 1840. Arch. naturg., **6**, p. 328.

Type-species: *Ophiura rosula* FLEMING, 1828. Brit. anim., p. 489 = *Asterias pentaphylla* PENNANT, 1777. Brit. zool., **4**, p. 64. Type designated by LYMAN, 1865.

805. O. ACESTRA H. L. CLARK, 1909. Mem. Austr. mus., **4**, p. 544, pl. 53, f. 4, 5.

3 specimens, including 1 PARATYPE. New South Wales: IN SHOALHAVEN BIGHT, 19–20 fms. Victoria: Westernport. Australia: Bass Strait.

Without definite locality.

806. O. ALOPECURUS Müller and Troschel, 1842. Syst. Ast., p. 111. Marktanner-Tumeretscher, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, pl. 13, f. 36–39.

29 specimens. Adriatic Sea. Trieste. Venice.

807. O. ANGULATA (Say).

Ophiura angulata Say, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 145.

Ophiothrix angulata Ayres, 1852. Proc. Boston soc. nat. hist., **4**, p. 249. Lütken, 1859. Add. ad hist. Oph., pt. 2, pl. 4, f. 1*a–g* (as *O. violacea*). Lyman, 1865. Illus. cat. M. C. Z., **1**, pl. 2, f. 1–3 (colored).

662 specimens. North Carolina: Oak Island; off Cape Fear, 17 fms. South Carolina: Charleston. Florida: off Charlotte Harbor, 11–20 fms.; off Turtle Harbor, 12 fms.; off St. Mary's River; off Sand Key; off French Reef; off Carysfort Reef; off Alligator Reef; off Sombrero Key; off Marquesas Keys; west of Tortugas, 36–101 fms. Mexico: Yucatan Bank; north of Jolbos Islands, 14 fms. Cuba: off northwest coast, 95 fms.; Bahia Honda; off Coutoy; off Mageros; Guadiana Bay. Jamaica: Montego Bay; Port Henderson; Port Royal; Drunkenman Cay; Port Maria. Off St. Cruz, D. W. I., 115 fms.; Flannegans Passage, 27 fms. St. Thomas. Haiti: Jeremie. Off Montserrat, 85 fms. Off Martinique, 96 fms. Off Dominica, 118 fms. Off St. Vincent, 124 fms. Off Carriacou, 163 fms. Off Grenada, 154–262 fms. Off Barbados, 13–100 fms. Panama: Aspinwall; Veragua. Brazil: Bahia; Porto Seguro; Cape Frio; Rio de Janeiro; Rat Island; Desterro. Off Rio de la Plata.

808. O. ARISTULATA Lyman, 1879. Bull. M. C. Z., **6**, p. 50, pl. 15, f. 421–424.

5 specimens, including 2 cotypes. Cape Colony: off Agulhas Bank, 150 fms. India: north of Madras, 210 fms.; Dutch East Indies: between Rotti and Timor, 120 fms.

809. O. ASPIDOTA Müller and Troschel, 1842. Syst. Ast., p. 115. Koehler, 1904. Mem. Soc. zool. France, **17**, p. 87, f. 50–54.

5 specimens. Philippine Islands. Dutch East Indies: Celebes [1]; Macassar.

810. O. BRACHYACTIS, sp. nov. (*βραχύς*, short + *ἀκτίς*, ray). Plate **12**, f. 1, 2.

Disk 3 mm. in diameter; arms 12 mm. long. Distinguishable at once from any of the other West Indian members of the genus, by the covering of the disk and the absence of any distinctive color markings. The disk is covered with rather coarse scales, each of which carries a coarse granule, which under high magnification is seen to be higher than thick and to be crowned with several

[1] Without definite locality.

sharp points; there are no spines, spinelets, or trifid thorns on the disk. Radial shields rather large, smooth, without granules, but separated radially, as well as interradially by granule-bearing plates. The arms are relatively short (hence the name) and the upper arm-plates are noticeably large; they are triangular, wider than long and so little in contact that the proximal angle is only slightly truncate. The under arm-plates are squarish, with rounded corners, the distal margin concave, the proximal convex, rather wider than long, broadly in contact. Color (dried from alcohol), bluish gray; disk darker than arms; oral surface nearly white.

HOLOTYPE (M. C. Z. 2480) and 1 PARATYPE (M. C. Z. 3927) Florida: TORTUGAS.

These two specimens were found among a lot of *angulata* and were at once seen to be quite different from that species. They have also been compared with young specimens of *lineata*, *örstedii*, *pallida*, and *suensonii* and are certainly not the young of any of those species. Comparison with numerous Old World species has failed to reveal any form to which they could reasonably be referred.

811. O. CAESPITOSA LYMAN, 1879. Bull. M. C. Z., **6**, p. 53, pl. 15, f. 417–420.

12 specimens, including 1 COTYPE. New South Wales: PORT JACKSON; off Broken Head, 28 fms.; off Wollongong, 55–56 fms.; Jervis Bay. Victoria: Westernport. Australia.

812. O. CAPILLARIS LYMAN, 1879. Bull. M. C. Z., **6**, p. 51, pl. 14, f. 401–404.

3 COTYPES. Philippine Islands: near Cebu, 95–100 fms.

813. O. CATAPHRACTA VON MARTENS, 1870. Arch. naturg., **36**, p. 259.

3 specimens. Philippine Islands, 6–10 fms.

814. O. DEMESSA LYMAN, 1861. Proc. Boston soc. nat. hist., **8**, p. 82. KOEHLER, 1905. Siboga-exp. Oph. litt., pl. 9, f. 5, 6.

13 specimens, including HOLOTYPE and 6 PARATYPES. HAWAIIAN ISLANDS: Hawaii, Hilo; Maui; French Frigate Shoal. GILBERT ISLANDS. Society Islands. Torres Strait: Murray Islands, Mer.

815. O. DUMOSA LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 252. Plate **12**, f. 6.

4 specimens, including 1 COTYPE. California: Pacific Grove: SAN DIEGO. Mexico: Guaymas.

816. O. DYSCRITA, sp. nov. (δύσκριτος, hard to determine). Plate 13, f. 3.

Disk 2 mm. in diameter; arms 20 mm. long, becoming moniliform distally. Disk covered with minute scales which carry low and slender 3-pronged spinelets; these are largest and most crowded in the interradii at and below the disk-margin. Radial shields large and more or less bare but not clearly defined. Upper arm-plates diamond-shaped, longer than wide (except the basal ones), in contact only at base of arm and widely separated distally; the distal angle tends to become swollen and more or less projecting on the moniliform part of arm. Oral shields two or three times as wide as long and adoral plates very long and narrow. Under arm-plates long, becoming much longer than wide, quadrilateral with distal margin markedly concave, broadly in contact. Side arm-plates large and conspicuous, especially distally, meeting broadly above; each carries 4 or 5 very slender and very thorny arm-spines; the next to the uppermost is usually longest and nearly equals three arm-joints. Color (in life, and also dried), pale purple above, without markings; whitish beneath.

HOLOTYPE (M. C. Z. 3798). Torres Strait: Murray Islands, MER, off southwestern reef, 18 fms., in a sponge. Oct. 13, 1913. Carnegie Exp. 1913. H. L. Clark coll.

Although most of the characters shown by this specimen indicate very early youth, it entirely lacks the large central plate of the disk, which is so characteristic of young Ophiothrix. It has been carefully compared with young *stelligera* of the same size and with the young of many other species, but there is none to which it can be referred. The difficulty of determining single, small specimens of Ophiothrix is exceptionally great however (hence the name) and I do not feel satisfied that this specimen will not prove to be the young of some previously known species.

817. O. ECHINATA (DELLE CHIAJE).

Asterias echinata DELLE CHIAJE, 1828. Mem. anim. sans Vert. Napoli, **3**, p. 74, 78, pl. 34, f. 5–8.
Ophiothrix echinata MÜLLER and TROSCHEL, 1840. Arch. naturg., **6**, p. 329.

79 specimens. Mediterranean Sea. Trieste. NAPLES. Nice. Algeria: Oran.

818. O. ELEGANS LÜTKEN, 1869. Add. ad hist. Oph., pt. 3, p. 57, 99. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 110, f. 82–86.

1 specimen. Pelew Islands.

819. O. EUSTEIRA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 265, f. 132.

1 PARATYPE. Japan: Ousima.

820. O. EXIGUA LYMAN, 1874. Bull. M. C. Z., **3**, p. 236, pl. 4, f. 24–26. KOEHLER, 1905. Siboga-exp. Oph. litt., pl. 9, f. 15, 16.

13 specimens, including HOLOTYPE and 10 PARATYPES. PHILIPPINE ISLANDS, 6–35 fms. Hong Kong. Amboina.

821. O. EXPEDITA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 96, pl. 9, f. 10–14.

1 COTYPE. Dutch East Indies: Sapeh Strait, 38 fms.

822. O. FRAGILIS (ABILDGAARD).

Asterias fragilis ABILDGAARD, 1789. In Müllers Zool. Dan., **3**, p. 28, pl. 98.
Ophiothrix fragilis DÜBEN and KOREN, 1846. Kongl. Vet.-akad. Handl. f. 1844, p. 238.

28 specimens. Northern Europe. Sweden: Bohuslän. Norway. DENMARK: Öresund. Heligoland.

823. O. FUMARIA MÜLLER and TROSCHEL, 1842. Syst. ast., p. 113. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 77, f. 33–35.

1 specimen. Dutch East Indies: Banka Strait.

824. O. GALAPAGENIS LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 181, pl. 20, f. 1–4.

1 COTYPE. NEAR GALAPAGOS ISLANDS, 53 fms.

825. O. GALATEAE LÜTKEN, 1872. Ov. Kongl. Danske vid. selsk. Forh., p. 90, 108.

1 specimen. Philippine Islands.

826. O. HIRSUTA MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 111. DUNCAN, 1887. Journ. Linn. soc. Zool., **21**, pl. 9, f. 18, 19 (as *O. variabilis*).

38 specimens, including holotype and 2 paratypes of *O. cheneyi* Lyman. Red Sea. Zanzibar. Philippine Islands. West Australia: Sharks Bay. Torres Strait: Murray Islands, Mer.

827. O. HYBRIDA, sp. nov. Plate **12**, f. 5.

Disk 8 mm. in diameter; arms 55–60 mm. long. Disk covered with a coat of scales, each of which carries a slender, acute spine about .4–.5 mm. long; these spines are not perfectly smooth but they are not very thorny. Radial shields large, bare, and smooth, separated radially by a series of spine-bearing plates. Upper arm-plates nearly twice as wide as long, broadly in contact; proximal margin straight, much shorter than distal, which is broadly curved or may be angularly bent on each side. Oral shields longer than broad, or at least as long, somewhat pentagonal with rounded corners or bud-shaped, with concave, proximal margins. Adoral plates large, usually in contact proximally. Under arm-plates squarish with corners rounded, broadly in contact, becoming dis-

tinctly longer than wide. Side arm-plates low and small with seven glassy, thorny spines, of which the longest about equals three joints. Tentacle-scale rather large for an Ophiothrix. Color (dried), dull purplish blue; outer ends of radial shields and the upper arm-plates somewhat variegated with whitish; a distinct median white stripe bordered with somewhat darker purplish blue marks on the upper side of the arm, and distally the upper margin of each side arm-plate is also whitish; under arm-plates purplish, with a broad median white stripe; oral region pale yellowish; arm-spines and disk spines glassy or whitish.

HOLOTYPE (M. C. Z. 2481). Fiji Islands or Samoa; locality doubtful. Received from Museum Godeffroy.

This specimen combines so well the characters of *O. trilineata* and of *O. longipeda* (or one of its close allies) that it is not at all unlikely it is a hybrid (hence the name). The disk is very much like that of *trilineata* but has more spinelets, while the arm-plates and spines are more like those of *longipeda;* the coloration is also suggestive of the latter, while the length of the arms is quite intermediate between the two. Since the two species occur abundantly on the same reefs, their hybridization is not impossible but I am not willing to affirm it on the strength of one specimen.

828. O. HYLODES H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 263, f. 130.

6 specimens, including 1 PARATYPE. Japan: AYUKAWA; Tokyo Bay. China Sea, near Pulo Sapatou.

829. O. KOREANA DUNCAN, 1879. Journ. Linn. soc. Zool., **14**, p. 473. H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 260, f. 127, 128.

92 specimens. Korea Strait, 59 fms. Japan: Hakodate Bay, 15.5 fms.; Sea of Japan, 79 fms.; off Cape Tsiuka, 44–47 fms.; southwest of Goto Islands, 139 fms.; off Kagoshima Gulf, 103–152 fms.; off eastern coast, 52–77 fms.; Uraga Channel, 70–197 fms.; Suruga Gulf, 78–131 fms.; mouth of Bay of Yeddo.

830. O. LINEATA LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 201. Plate **12**, f. 4.

7 specimens, including the HOLOTYPE. FLORIDA: EAST COAST; Miami; off Sand Key, 20 fms.

831. O. LIODISCA, sp. nov. (λεῖος, smooth + δίσκος, disk). Plate **12**, f. 3.

Disk 6 mm. in diameter; arms 30–35 mm. long. Disk flat and perfectly smooth (hence the name), covered with a coat of rather large scales, the central one largest; there are 9–10 series between center and interradial margin and about 5 series across interradial area between radial shields. Interbrachial

areas between the arms covered with somewhat small scales each of which bears a slender spinelet; towards the mouth the scales disappear and the area is covered only by a thin naked skin. Radial shields rather large, smooth, separated from each other by a longitudinal series of 4–6 scales. Upper arm-plates quadrilateral; proximal margin short, straight; distal margin much longer, broadly convex and slightly thickened or swollen; lateral sides slightly concave; the plates are thus somewhat fan-shaped; they are at first wider than long but become longer than wide and they are in contact the full width of the proximal margin. Oral shields nearly twice as wide as long, diamond-shaped with rounded angles. Adoral plates rather large, triangular with blunt and rounded angles, meeting within. Under arm-plates nearly rectangular, longer than wide, broadly in contact. Side arm-plates moderate; each carries 3–5 (usually 4) slightly thorny, glassy arm-spines; uppermost or next, longest and rather exceeding two arm-joints; lowest slender but rough pointed. Tentacle-scale scale-like, rather large for an Ophiothrix. Color (dried), pale olive, distal tips of radial shields with white markings; upper surface of arm with a narrow median pale brownish stripe bordered on each side with a broader white stripe which is bounded on the outer side with a narrow dark olive line; on each upper arm-plate the white bands widen a little but abruptly narrow again as they pass onto the next plate; oral region and lower surface of arms nearly white.

Holotype (M. C. Z. 3800). Torres Strait: Murray Islands, Mer, southwestern reef, on under side of a coral fragment. Oct. 27, 1913. Carnegie Exp. 1913. H. L. Clark coll.

It is possible that this species ought to be put in Ophiotrichoides but after comparing it with the type species of that genus, I do not feel satisfied that the two are congeneric, and prefer to leave this new species in Ophiothrix until that genus is divided into its component parts, when the real relationships will more easily be brought out. In life there were orange-colored markings on the upper surface of the arms, but as the specimen was taken only a few hours before leaving Mer, when all our apparatus was packed up and time was precious there was no opportunity for a sketch to be made or even for careful notes on the coloration to be taken.

832. O. LONGIPEDA (Lamarck).

Ophiura longipeda Lamarck, 1816. Anim. sans Vert., **2**, p. 544.
Ophiothrix longipeda Müller and Troschel, 1842. Syst. Ast., p. 113.[1]

[1] Herklots (1869. Echinod. peintes d'apres nature, pl. 7) gives a colored figure purporting to be *O. longipeda*, but as it is totally unlike any *longipeda* which I have seen either living or preserved, I feel confident that it represents a different species.

76 specimens. Persian Gulf. Zanzibar MAURITIUS. Japan: Ousima. Philippine Islands [1]: Cebu, Bantayan Reef. Pelew Islands. Amboina. Java. New Guinea: Sorong. Torres Strait: near Cape York; Badu; Friday Island; Erub; Murray Islands, Mer. Queensland: near Cooktown; Green Island, near Cairns. Marshall Islands: Ebon. Fiji Islands: near Suva. Society Islands: Papeete.

833. O. LUSITANICA LJUNGMAN, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 625.

7 specimens, including 1 COTYPE. France: St. Vaast-de-la-Houge. Portugal: SETUBAL. Naples.

834. O. LÜTKENI WYVILLE THOMSON, 1873. Depths of the sea, p. 100. KOEHLER, 1909. Princesse-Alice Echinod., pl. 29, f. 8–10.

1 specimen. Loc.? "Porcupine" coll.

835. O. MACROBRACHIA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 267, f. 133.

9 PARATYPES. Japan: OFF EASTERN COAST, 34–48 fms.; off Oshima Light, 65 fms.

836. O. MAGNIFICA LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 254. H. L. CLARK, 1910. Bull. M. C. Z., **52**, pl. 9, f. 4.

97 specimens, including 1 COTYPE. PERU [1]: Payta; Bay of Sechura, 5–6 fms.

837. O. MARTENSI LYMAN, 1874. Bull. M. C. Z., **3**, p. 234, pl. 4, f. 9, 10.

17 specimens, including HOLOTYPE and 10 PARATYPES. PHILIPPINE ISLANDS. Australia: Dietrich.[2] Torres Strait: Thursday Island; Murray Islands, Mer.

838. O. MELANOSTICTA GRUBE, 1868. Jahrsb. Schles. ges. vaterl. cultur, **45**, p. 45. KOEHLER 1905. Siboga-exp. Oph. litt., pl. 8, f. 4–6; pl. 14, f. 3.

2 specimens. Borneo. Torres Strait: off Goode Island, 2–3 fms.

839. O. NEREIDINA (LAMARCK).

Ophiura nereidina LAMARCK, 1816. Anim. sans Vert., **2**, p. 544.
Ophiothrix nereidina MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 115. DÖDERLEIN, 1896., Jena. denksch., **8**, pl. 16, f. 16, 16*a*.

35 specimens. Ceylon. Dutch East Indies: Macassar Strait, Borneo Bank, 20 fms. Torres Strait: Murray Islands, Mer.

[1] Without definite locality. [2] I have been unable to locate this place.

840. O. OBTUSA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 98, pl. 11, f. 6–10, pl. 16, f. 5.

1 COTYPE. Dutch East Indies: Flores, BAY OF MADURA, 38–50 fms.

841. O. OLIVERI BENHAM, 1911. Trans. N. Z., inst., **43**, p. 154, f. 14–17.

1 COTYPE. Kermadec Islands: SUNDAY ISLAND, Coral Bay.

842. O. ÖRSTEDII LÜTKEN, 1856. Vid. med., p. 15. 1859. Add. ad hist. Oph., pt. 2, p. 149, pl. 4, f. 3*a*–*e*.

322 specimens. Florida: Miami; Key Biscayne; Cape Florida; off Carysfort Reef, 206 fms.; Key West; Tortugas. Panama: Veragua. Venezuela: Bay of Cumana. Jamaica: Montego Bay. ST. THOMAS.

843. O. PALLIDA LJUNGMAN, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 626. KOEHLER, 1913. Zool. jahrb. Suppl., **11**, pl. 20, f. 5; pl. 21, f. 10, 11.

1 COTYPE. ANGUILLA, 180 fms.

844. O. PANCHYENDYTA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 264, f. 131.

1 PARATYPE. KOREA STRAIT, 59 fms.

845. O. PENTAPHYLLUM (PENNANT).

Asterias pentaphyllum PENNANT, 1777. Brit. zool., **4**, p. 64.
Ophiothrix pentaphyllum LJUNGMAN, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 622.

20 specimens. BRITISH SEAS. Scotland: Oban. England: Liverpool; Isle of Wight, 35 fms. Wales: Milford? Madeira Islands?.

846. O. PETERSI STUDER, 1882. Abh. K.-Preus. akad. wiss. Berlin, p. 25, pl. 3, f. 12–12*e*.

3 COTYPES. WEST OF THE BISSAGOS ISLANDS, 150 fms.

847. O. PLANA LYMAN, 1874. Bull. M. C. Z., **3**, p. 238, pl. 4, f. 1–8.

7 specimens, including HOLOTYPE and 2 PARATYPES. PHILIPPINE ISLANDS, 25–30 fms. Sulu Archipelago: Sulu Island, Sulu Harbor, 8 fms. Dutch East Indies: Celebes, Macassar.

848. O. POECILODISCA, sp. nov. (*ποικίλος*, ornamented + *δίσκος*, disk). Plate **13**, f. 5.

Disk 10 mm. in diameter; arms 40–45 mm. long. Disk covered with large scales, scarcely 100 all told, about half of which carry slender, terete spinelets, 1 mm. long. Radial shields large, perfectly smooth, separated from each other by a longitudinal series of 3 or 4 long scales. Upper arm-plates hexagonal or pentagonal with somewhat rounded angles, or quadrilateral with distal margin widely curved, in contact for the width of the proximal margin, wider than long basally but becoming longer than wide distally. Interbrachial spaces below covered by bare skin except centrally at and near margin where there is a

group of spine-bearing plates. Oral shields much wider than long, rounded pentagonal; madreporite nearly or quite twice as large as the others. Adoral plates large, somewhat triangular, usually meeting within. Under arm-plates quadrilateral, much wider than long, distal margin concave, more or less widely separated from each other. Side arm-plates not conspicuous; each carries a series of 7–8 glassy arm-spines which may be slender, smooth and pointed or somewhat stouter with thickened thorny tips. Tentacle-scale distinct and scale-like. Color (dried from alcohol), reddish or reddish white marked on the disk with a complex, ornate pattern of dark red lines; arms (dorsally) prettily banded with dark red, a transverse stripe across each upper arm-plate and another between every two plates; there is also a short transverse dash on the distal half of each plate; under arm-plates whitish, each with a transverse stripe or mark of dark red. In the holotype, the pattern both on disk and arms is more or less obscure, so the description is made from another specimen. In a third individual (disk-diameter about 6 mm.), the center of disk and the interradial areas are bluish gray speckled with blackish and the only red shade is on the radial shields, but the arms show the characteristic transverse markings, albeit somewhat indistinctly.

HOLOTYPE (M. C. Z. 2476) and 7 PARATYPES (M. C. Z. 3928). ZANZIBAR.

These specimens were sent to the Museum at various times in 1861 and 1862 by Messrs. Caleb Cooke and William Webb and are marked by Mr. Lyman, "Ophiothrix sp. nov.?"; on one label the words "Poor condition" are added. They certainly do not belong to any of the species hitherto recorded from the western Indian Ocean but they are evidently nearly related to *O. trilineata* and to *O. tristis*. The color-pattern and the form of the under arm-plates will distinguish them at once from either of those species however.

849. O. PROPINQUA LYMAN, 1861. Proc. Boston soc. nat. hist., **8**, p. 83. KOEHLER, 1898. Bull. sci., **31**, pl. 3, f. 20–22.

22 specimens, including HOLOTYPE. Zanzibar. Mauritius. Philippine Islands, 6 fms. Portuguese East Indies: off east end of Timor 15–30 fms. Torres Strait: Murray Islands, Mer. GILBERT ISLANDS.

850. O. PROTEUS KOEHLER, 1905. Siboga-exp. Oph. litt., p. 100. 1898. Bull. sci., **31**, pl. 2, f. 11–14 (as *O. comata*).

1 specimen. Dutch East Indies: Kei Islands, 50 fms.

851. O. PURPUREA VON MARTENS, 1867. Monatsb. K.-Preus. akad. wiss. Berlin, p. 346. DÖDERLEIN, 1896. Jena. denkschr., **8**, pl. 17, f. 23, 23*a*.

4 specimens. Philippine Islands, 35 fms.; Cebu, Bantayan Reef, 4–6 fms.

852. O. PUSILLA Lyman, 1874. Bull. M. C. Z., **3**, p. 235, pl. 3, f. 21–30.

Holotype and 2 paratypes. Philippine Islands, 15 fms.

853. O. QUINQUEMACULATA (Delle Chiaje).

Asterias quinquemaculata Delle Chiaje, 1829. Mem. anim. sans Vert. Napoli, **4**, p. 197, pl. 68, f. 1.
Ophiothrix quinquemaculata Müller and Troschel, 1840. Arch. naturg., **6**, p. 329.

47 specimens. Mediterranean Sea. France: Cette. Nice. Leghorn; Naples.

854. O. RHABDOTA, sp. nov. (*ῥαβδωτός*, striped). Plate **13**, f. 4.

Disk 13 mm. in diameter; arms about 150 mm. Distinguishable from the various species of the *longipeda* group only by its coloration. The upper surface of the arms is marked by three longitudinal lines (hence the name), which are yellow in life but become whitish in preserved specimens; these stripes are usually most distinct near the tips of the arms. The lower surface of the arms is very dark with a wide median stripe, yellowish in life but whitish in preserved specimens.

Holotype (M. C. Z. 3816) and 6 paratypes (M. C. Z. 3817, 3818, 3876). Torres Strait: Erub; Murray Islands, Mer. Sept.-Oct., 1913. Carnegie Exp. 1913. H. L. Clark coll.

I have hesitated long before adding another species to this perplexing group and the chief justification for doing so is that it is at least easily recognized. Even after several weeks of study of *longipeda* on the reefs where it is common, I have been unable to decide whether all these large, long-armed examples of Ophiothrix ought to be referred to *longipeda* or not. I very much doubt the validity of *hirsuta*, *punctolimbata*, and *galateae*, while *expedita* appears more worthy of recognition. I would maintain for the present at least *obtusa* and *rhabdota* but am inclined to believe that further study, with more abundant material, will result in uniting at least four of these nominal species, under the name *longipeda*.

855. O. RUDIS Lyman, 1874. Bull. M. C. Z., **3**, p. 239, pl. 3, f. 11–14. McClendon, 1909. Univ. Cal. publ. Zool., **6**, pl. 5, f. 30, 31.

Holotype and 4 paratypes. California: San Diego.

856. O. SMARAGDINA Studer, 1882. Abh. K.-Preus. akad. wiss. Berlin, p. 26. Koehler, 1904. Mem. Soc zool. France, **17**, p. 93, f. 60–63.

1 cotype. Off Northwestern Australia, 50 fms.

857. O. SPICULATA Leconte, 1851. Proc. Acad. nat. sci. Phil., **5**, p. 318. McClendon, 1909. Univ. Cal. publ. Zool., **6**, pl. 6, f. 38, 39.

172 specimens, including 20 cotypes. California: Monterey; 5 miles

south of Santa Barbara; San Diego. Lower California: Magdalena Bay; Cape St. Lucas; San Francisquito Bay; Los Animas Bay. Mexico: Mazatlan; Acapulco. PANAMA. Pearl Islands. Galapagos Islands. Peru: Payta; Bay of Sechura, 5 fms.; near Capon. Chile.

858. O. SPONGICOLA STIMPSON, 1855. Proc. Acad. nat. sci. Phil., **7**, p. 385. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 95, f. 64–68.

4 specimens. New South Wales: PORT JACKSON, 2–6 fms.; off Broken Head, 28 fms.

859. O. STELLIGERA LYMAN, 1874. Bull. M. C. Z., **3**, p. 237, pl. 3, f. 15–20.

31 specimens, including the HOLOTYPE. PHILIPPINE ISLANDS. Sulu Archipelago: off North Ubian, 9–13 fms. Dutch East Indies: near Paternoster Islands, 20 fms. Torres Strait: Murray Islands, Mer. Mauritius. Zanzibar.

860. O. STRIOLATA GRUBE, 1868. Jahrsb. Schles. ges. vaterl. cultur, **45**, p. 45. DÖDERLEIN, 1896. Jena. denkschr., **8**, pl. 17, f. 22, 22*a*.

8 specimens. China Sea. Philippine Islands, 6–35 fms. Torres Strait: Friday Island.

861. O SUENSONII LÜTKEN, 1856. Vid. med., p. 16. 1859. Add. ad hist. Oph., pt. 2, pl. 4, f. 2*a–e*.

76 specimens. Gulf of Mexico, 101 fms. Florida [1]: off Turtle Harbor, 12 fms.; Tortugas. Bahamas [1]: off Double-headed Shot Key, 3–6 fms. Cuba: Bahia Honda. Jamaica: Montego Bay. Haiti: cays near Caymites. St. Cruz, D. W. I., Flannegan's Passage, 27 fms. Off ST. THOMAS. Off Montserrat, 88–120 fms. Off Dominica, 84–120 fms. Off St. Vincent, 124 fms. Off Grenada, 92–262 fms. Off Barbados, 13–127 fms. Venezuela: Cumana Bay; Carthagena.

862. O. TRIGLOCHIS MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 114. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 81, f. 41–45.

2 specimens, including 1 COTYPE. Natal: PORT NATAL. Australia.

863. O. TRILINEATA LÜTKEN, 1869. Add. ad hist. Oph., pt. 3, p. 58, 100.

140 specimens. Mozambique. Mauritius. Dutch East Indies: Strait of Macassar, Borneo Bank, 20 fms.; Celebes. Torres Strait: Murray Islands, Mer. Pelew Islands. SAMOA.

864. O. TRILOBA VON MARTENS, 1870. Arch. naturg., **36**, p. 260. DÖDERLEIN, 1896. Jena. denksch., **8**, pl. 16, f. 15, 15*a*.

1 COTYPE. RED SEA.

[1] Without definite locality.

865. O. VIRGATA LYMAN, 1861. Proc. Boston soc. nat. hist., **8**, p. 82. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 80, f. 36–40.

4 specimens, including the HOLOTYPE. GILBERT ISLANDS. Torres Strait: Murray Islands, Mer.

Species of Ophiothrix not represented in the M. C. Z.

866. O. ANDERSONI DUNCAN, 1887. Journ. Linn. soc. zool., **21**, p. 95, pl. 9, f. 12, 13. Mergui Archipelago: Elphinstone Island.

867. O. ARMATA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 103, pl. 10, f. 1, 2. Dutch East Indies: Banda.

868. O. BEATA KOEHLER, 1907. Bull. sci., **41**, p. 330, pl. 13, f. 40–42. Northeastern Africa: Suez; Djibouti.

869. O. BEDOTI DE LORIOL, 1893. Rev. Suisse de zool., **1**, p. 420, pl. 15, f. 1–1*f*. Amboina.

870. O. BELLI DÖDERLEIN, 1896. Jena. denkschr., **8**, p. 292, pl. 16, f. 14, 14*a*. Torres Strait: Thursday Island.

871. O. BERBERIS LYMAN, 1879. Bull. M. C. Z., **6**, p. 52, pl. 15, f. 425–428. Philippine Islands: Cebu, 95–100 fms. Dutch East Indies: Kei Islands, 129 fms.

872. O. CAPENSIS LÜTKEN, 1869. Add. ad hist. Oph., pt. 3, p. 59, 100. Cape of Good Hope.

873. O. CARINATA VON MARTENS, 1870. Arch. naturg., **36**, 1, p. 255. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 90, f. 55–59. Singapore.

874. O. CILIARIS (LAMARCK), 1816. Anim. sans Vert., **2**, p. 545 (*Ophiura*). LYMAN, 1874. Bull. M. C. Z., **3**, p. 233, pl. 4, f. 29–32. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 100, f. 74, 75. East Indies.

875. O. CLARESCENS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 150, pl. 29, f. 8, pl. 30, f. 3. Dutch East Indies: Kei Islands, 170 fms.

876. O. COMATA MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 112. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 105, f. 79–81. Loc. ?

877. O. CONGENSIS KOEHLER, 1911. Ann. Inst. ocean., **2**, fasc. 5, p. 21, pl. 1, f. 5–7, pl. 2, f. 15. Congo Free State: Banana.

878. O. CONVOLUTA KOEHLER, 1914. Bull. 84 U. S. N. M., p. 122, pl. 16, f. 1–6. Loc.?

879. O. CORONATA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 91, pl. 9, f. 8, 9. Dutch East Indies: off Waigeu, 45 fms.

880. O. CRASSISPINA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 147, pl. 28, f. 3–5, pl. 30, f. 4. Dutch East Indies: Sumbawa, Saleh Bay, 152 fms.

881. O. DARWINI BELL, 1884. Alert rept., p. 144. South Australia (northern territory): Port Darwin.

882. O. DEPOSITA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 146, pl. 29, f. 4–7. Dutch East Indies: near Kei Islands, 113–173 fms.; near Rotti, 290 fms.

883. O. DILIGENS KOEHLER, 1898. Bull. sci., **31**, p. 103, pl. 5, f. 40–43. Andaman Islands, 41 fms.

884. O. EXHIBITA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 110, pl. 10, f. 10–13. Dutch East Indies: Sumbawa, Saleh Bay, 152 fms.

885. O. FALLAX DE LORIOL, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 47, pl. 25, f. 2–2*e*. Mauritius.

886. O. FOVEOLATA MARKTANNER-TURNERETSCHER, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 313, pl. 13, f. 32, 33. Aru Islands.

887. O. FULGENS KOEHLER, 1905. Siboga-exp. Oph. litt., p. 107, pl. 10, f. 3–6. Dutch East Indies: Kei Islands, 50 fms.; Paternoster Islands, 20 fms.

888. O. GRACILIS KOEHLER, 1911. Ann. Inst. ocean., **2**, fasc. 5, p. 19, pl. 1, f. 1–4. West Africa: estuary of the Congo.

889. O. HARTMEYERI Koehler, 1907. Fauna Südwest-Australiens, **1**, p. 248, f. 4–6. West Australia: Sharks Bay, Sunday Island.

890. O. INDIGNA Koehler, 1906. Mem. Soc. zool. France, **19**, p. 27, pl. 3, f. 38–42. South of Cape St. Vincent (Portugal), 84 fms. West of Madeira Islands, 206 fms.

891. O. INDUCTA Koehler, 1906. Mem. Soc. zool. France, **19**, p. 29, p. 1, f. 17–19. South of Canary Islands, 228 fms. Near Madeira Islands, 125 fms.

892. O. INFIRMA Koehler, 1905. Siboga-exp. Oph. litt., p. 89, pl. 8, f. 10–13. Dutch East Indies: Kei Islands, 50 fms.; Flores, Molo Strait, 30–50 fms.

893. O. INNOCENS Koehler, 1898. Bull. Soc. zool. France, **23**, p. 164. 1900. Investigator shallow-water Oph., pl. 18, f. 26–28, pl. 19, f. 39. South of Ceylon, 34 fms.

894. O. INSIDIOSA Koehler, 1898. Bull. sci., **31**, p. 91, pl. 4, f. 34–36. Off Ceylon, 34 fms. Andaman Islands, 20 fms.

895. O. LEPIDA de Loriol, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 45, pl. 25, f. 1–1*f*. Mauritius.

896. O. LORIOLI Döderlein, 1896. Jena. denkschr., **8**, p. 297, pl. 17, f. 24, 24*a*. Amboina.

897. O. MACULATA Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 623. Eastern Atlantic: Josephine Bank, 110–120 fms.

898. O. MARENZELLERI Koehler, 1904. Mem. Soc. zool. France, **17**, p. 103, f. 76–78. Japan.

899. O. MARGINATA Koehler, 1905. Siboga-exp. Oph. litt., p. 79, pl. 8, f. 7–9. Aru Islands, 7 fms.

900. O. MAURITIENSIS de Loriol, 1893. Mem. Soc. Phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 38, pl. 24, f. 5–5*e*. Mauritius.

901. O. MELANOGRAMMA Bell, 1884. Alert rept., p. 145. Torres Strait: Prince of Wales Channel.

902. O. MERGUIENSIS Duncan, 1887. Journ. Linn. soc. Zool., **21**, p. 96, pl. 9, f. 14, 15. Mergui Archipelago: Owen Island.

903. O. MICHAELSENI Koehler, 1907. Fauna Südwest-Australiens, **1**, p. 250, f. 7–10. West Australia: Koombana Bay; Sharks Bay.

904. O. MICROPLAX Bell, 1884. Alert rept., p. 143. South Australia (northern territory): Port Darwin.

905. O. MILES Koehler, 1905. Siboga-exp. Oph. litt., p. 90, pl. 9, f. 1–4. Dutch East Indies.

906. O. NOBILIS Koehler, 1905. Siboga-exp. Oph. litt., p. 83, pl. 11, f. 1, 2; pl. 15, f. 4. Dutch East Indies: Kei Islands, 50 fms.

907. O. NOCIVA Koehler, 1907. Bull. sci., **41**, p. 335, pl. 13, f. 43, 45. West Africa: Congo.

908. O. OTIOSA Koehler, 1898. Bull. sci., **31**, p. 99, pl. 3, f. 17–19. India: Malabar Coast, 36 fms.

909. O. PARASITA Müller and Troschel, 1844. Arch. f. naturg., **10**, p. 184. Australia.

910. O. PICTETI de Loriol, 1893. Rev. Suisse zool., **1**, p. 423, pl. 15, f. 3–3*e*. Amboina.

911. O. PICTURATA de Loriol, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 49, pl. 25, f. 3–3*g*. Mauritius.

912. O. PLANULATA Stimpson, 1855. Proc. Acad. nat. sci. Phil., **7**, p. 386. West of New Caledonia: Groper Shoal, 15 fms.

913. O. PULCHELLA Koehler, 1905. Siboga-exp. Oph. litt., p. 106, pl. 11, f. 11, 12, pl. 15, f. 3. Dutch East Indies: six stations, 40–137 fms.

914. O. PUNCTOLIMBATA von Martens, 1870. Arch. f. naturg., **36**, p. 257. Döderlein, 1896. Jena. denkschr., **8**, pl. 16, f. 18, 18*a*. Java.

915. O. RATHBUNI Ludwig, 1882. Brasil. Echinod., p. 19. Brazil.

916. O. ROBILLARDI de Loriol, 1883. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 39, pl. 24, f. 3–3*f*. Mauritius.

917. O. ROSEOCOERULANS Grube, 1868. Jahrsb. Schles. ges. vaterl. cultur., **45**, p. 45. Koehler, 1904. Mem. Soc. zool. France, **17**, p. 97, f. 69–73. St. Helena.

918. O. ROTATA von Martens, 1870. Arch. f. naturg., **36**, p. 258. Philippine Islands: Mindanao; Zamboanga.

919. O. SCORPIO (Müller and Troschel), 1842. Syst. Ast., p. 118 (*Ophionyx*). Koehler, 1907. Bull. sci., **41**, p. 337, pl. 14, f. 56, 58. Red Sea.

920. O. SIMPLEX Koehler, 1905. Siboga-exp. Oph. litt., p. 109, pl. 10, f. 7–9. Dutch East Indies: Flores, Molo Strait, 38–50 fms.

921. O. SPECIOSA Koehler, 1898. Bull. sci., **31**, p. 93, pl. 4, f. 29–33. Andaman Islands.

922. O. SPINOSISSIMA Koehler, 1905. Siboga-exp. Oph. litt., p. 104, pl. 11, f. 3–5. Dutch East Indies: Lombok, 12 fms.; Banda, 5–20 fms.

923. O. STABILIS Koehler, 1904. Mem. Soc. zool. France, **17**, p. 84, f. 46–49. Japan.

924. O. TENERA Brock, 1888. Zeit. f. wiss. zool., **47**, p. 519. Koehler, 1904. Mem. Soc. zool. France, **17**, p. 113, f. 87–91. Bay of Bengal.

925. O. TENUIS Koehler, 1905. Siboga-exp. Oph. litt., p. 74, pl. 8, f. 1, 2. Dutch East Indies: Flores, Badjo Bay, 22 fms.

926. O. TRISTIS de Loriol, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 50, pl. 25, f. 4–4*f*. Mauritius.

927. O. VARIEGATA Duncan, 1887. Journ. Linn. soc. Zool., **21**, p. 97, pl. 9, f. 16, 17. Mergui Archipelago: Elphinstone Island.

928. O. VIATOR Koehler, 1904. Siboga-exp. Oph. mer prof., p. 148, pl. 31, f. 5–8. Dutch East Indies: Kei Islands, 170 fms.

929. O. VIRIDIALBA von Martens, 1867. Monatsb. K.-Preus. akad. wiss. Berlin, p. 347. China Sea, 40 fms.

930. O. VITREA Döderlein, 1896. Jena. denkschr., **8**, p. 295, pl. 16, f. 21, 21*a*. Amboina.

Ophiotrichoides.

Ludwig, 1882. Brasil. Echinod., p. 20.

Type-species: *Ophiotrichoides lymani* Ludwig, 1882. *op. cit.*, p. 21. Monotypic.

931. O. LYMANI Ludwig, 1882. Brasil. Echinod., p. 21. Koehler, 1907. Bull. sci., **41**, pl. 13, f. 48, 49.

1 specimen. Cape Verde Islands.

Ophio pteron.

Ludwig, 1888. Zeits. f. wiss. zool., **47**, p. 459.

Type-species: *Ophiopteron elegans* Ludwig, 1888. *loc. cit.* Monotypic when established.

932. O. PUNCTOCAERULEUM Koehler, 1905. Siboga-exp. Oph. litt., p. 114, pl. 12, f. 5–7, pl. 15, f. 6.

1 cotype. Dutch East Indies: Flores, Badjo Bay, 23 fms.

Species of Ophiopteron not represented in the M. C. Z.

933. O. ELEGANS Ludwig, 1888. Zeit. f. wiss. zool., **47**, p. 459, pl. 35, f. 1–11. Amboina.

934. O. GYMNATUM McIntosh, 1911. Proc. Roy. phys. soc. Edinb., **18**, p. 167, f. 1, 2. Mergui Archipelago: St. Luke's Island, Hastings Harbor.

935. O. SIBOGAE Koehler, 1905. Siboga-exp. Oph. litt., p. 113, pl. 12, f. 8–10. Dutch East Indies: Sumbawa, Sapeh Bay, 40 fms.

Ophiomaza.

Lyman, 1871. Illus. cat. M. C. Z., no. 6, p. 9.

Type-species: *Ophiomaza cacaotica* Lyman, 1871. *loc. cit.* Monotypic when established.

936. O. CACAOTICA Lyman, 1871. Illus. cat. M. C. Z., no. 6, p. 9, pl. 1, f. 15. Döderlein, 1896. Jena. denkschr., **8**, pl. 17, f. 26, 26*a*.

9 specimens, including HOLOTYPE and 2 PARATYPES. Zanzibar. China Sea. Torres Strait: near Booby Island, 6 fms.; Murray Islands, Mer, on comatulids.

937. O. OBSCURA (Ljungman).

Ophiocnemis obscura Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 333.
Ophiomaza obscura Lyman, 1874. Bull. M. C. Z., **3**, p. 233.

3 specimens. Torres Strait: Murray Islands, Mer, on comatulids.

Species of Ophiomaza not represented in the M. C. Z.

938. O. CATAPHRACTA (Brock), 1888. Zeits. f. wiss. zool., **47**, p. 522 (*Lütkenia*). Koehler, 1904, Mem. Soc. zool. France, **17**, p. 114, f. 92, 93. Queensland: Cape York.

939. O. MOERENS Koehler, 1898. Bull. sci., **31**, p. 85, pl. 2, f. 7, 8. Mergui Archipelago: Cantores Island, 8 fms.

Ophiocnemis.

Müller and Troschel, 1842. Syst. Ast., p. 83, 87.

Type-species: *Ophiura marmorata* Lamarck, 1816. Anim. sans Vert., **2**, p. 543. Monotypic when established.

940. O. MARMORATA (Lamarck).

Ophiura marmorata Lamarck, 1816. Anim. sans Vert., **2**, p. 543.
Ophiocnemis marmorata Müller and Troschel, 1842. Syst. Ast., p. 87. Döderlein, 1888, Zool. jahrb., **3**, pl. 32, f. 6*a*–6*c*.

18 specimens. Zanzibar. Cape of Good Hope. Ceylon: Trincomalee. Singapore.

Species of Ophiocnemis not represented in the M. C. Z.

941. O. COTTEAUI de Loriol, 1900. Rev. Suisse zool., **8**, p. 84, pl. 7, f. 11–11*g*. Liberia.

942. O. VENUSTA de Loriol, 1900. Rev. Suisse zool., **8**, p. 81, pl. 8, f. 2–2*g*, 3. Singapore.

Ophiothela.

Verrill, 1867. Trans. Conn. acad., **1**, p. 269.

Type-species: *Ophiothrix* (*Ophiothela*) *mirabilis* Verrill, 1867. *op. cit.*, p. 268. Type designated.

943. O. CAERULEA, sp. nov. (*caeruleus*, blue). Plate **14**, f. 1.

Disk 3 mm. in diameter; arms about 14 mm. long. Disk and *six* arms

covered above and below by a thick skin through which no plates, except the radial shields, can be distinguished even though the animal is completely dried; near the tip of the arm the under arm-plates are more or less visible. Radial shields more than a millimeter long but much less than half that wide; the six pairs cover nearly the entire disk; each shield bears 6–8 (or even more) granules of somewhat variable size and very irregularly placed; some of these granules are relatively large. In each interradial area, more or less near the center of disk (in two areas half way to margin) is a relatively very large, conical spine (.3 mm. long by .12 mm.± thick at base), smooth and sharp; at the margin of the disk (or just below) are several, typically 4, more such spines. The mouth-parts, side arm-plates and spines show no distinctive features; there are 5 arm-spines, the middle one largest. The position of each upper arm-plate is indicated by a rough knob which is apparently at the central, distal margin; between each pair of knobs, there is a conspicuous granule on each side of the basal arm-joints: these become smaller and ultimately disappear distally. Color (dried from alcohol): — disk variegated pale cream-color and dull blue (hence the name); arms irregularly but extensively banded with blue on upper surface; oral surface of disk and arms uniformly light.

HOLOTYPE (M. C. Z. 2497). ARABIAN GULF. April, 1861. Capt. C. Mullet coll.

This specimen was labeled by Mr. Lyman: "Ophiothela? sp. nov.?" but was never described. It is the largest Ophiothela in the collection and seems to be nearest to *isidicola*. It is distinguished from that and all other species by the thick skin, the smooth, sharp conical disk-spines and the color.

944. O. DANAE VERRILL, 1869. Proc. Boston soc. nat. hist., **12**, p. 391. DÖDERLEIN, 1896. Jena. denkschr., **8**, pl. 17, f. 25–25*b*.

11 specimens, including 10 COTYPES. FIJI ISLANDS. Dutch East Indies: Flores, Badjo Bay, 23 fms.

945. O. DIVIDUA VON MARTENS, 1879. Sitzb. Berlin ges. nat. Fr., p. 127.

3 COTYPES. South Africa: ALGOA BAY.

946. O. HADRA, sp. nov. (ἁδρός, stout). Plate **14**, f. 2.

Disk, 1.7 mm. in diameter; *six* arms, each 3–4 mm. long. Very similar to *O. verrilli* but the oral shields and adoral plates are very small and virtually indistinguishable; there are no spines on the adoral plates. The "knobbed spines" of the disk are nothing more than minute granules, except one much

larger one in each interradius. The knobs on the upper arm-plates are conspicuous. In proportion to its size, this species, compared with the other members of the genus, is notably stout or thick-set (hence the name). Color (dried from formalin): —disk nearly white with several pale rose-colored blotches; arms irregularly banded with dull gray and reddish.

HOLOTYPE (M. C. Z. 3831). Torres Strait: Murray Islands, MER, off west reef, 18 fms., on a sponge. Oct. 13, 1913. Carnegie Exp. 1913. H. L. Clark Coll.

The general appearance of this species is quite different from that of any other Ophiothela in the collection, the arms being so much shorter and thicker; but unfortunately I have had no specimens of *verrilli* for comparison. I think, however, there can be little doubt that this specimen is not that species, so it has seemed desirable to give it a name. The genus is a perplexing one on account of the small size and peculiar structural modifications. None of them exist in museums in adequate numbers for satisfactory study, but, contrary to Döderlein, I see no reason to doubt that those hitherto described are perfectly valid. The specimen of *hadra* figured on Plate **14** was taken by the Australian F. I. S. ENDEAVOUR off the east coast of Australia.

947. O. ISIDICOLA LÜTKEN, 1872. Ov. Kongl. Danske vid. selsk. Forh., p. 92, 107, pl. 2, f. 4*a*–4*f*.
23 specimens. Philippine Islands.

948. O. MIRABILIS VERRILL, 1867. Trans. Conn. acad., **1**, p. 268.
6 COTYPES. Panama: PEARL ISLAND.

949. O. TIGRIS LYMAN, 1871. Illus. cat. M. C. Z., no. 6, p. 10, pl. 1, f. 10–12.
HOLOTYPE and 1 PARATYPE. Loc.?

950. O. VINCULA MORTENSEN, 1913. Steenstrup's Mindeskrift, no. 10, p. 14, pl. 1, f. 11–13.
1 COTYPE. Philippine Islands: SAN BERNADINO STRAIT, 50–100 fms.

Species of Ophiothela not represented in the M. C. Z.

951. O. VERRILLI DUNCAN, 1879. Journ. Linn. soc. Zool., **14**, p. 477, pl. 11, f. 33. Korean Seas.

OPHIOPSAMMIUM.

LYMAN, 1874. Bull. M. C. Z., **3**, p. 231.

Type-species: *Ophiopsammium semperi* LYMAN, 1874. *op. cit.*, p. 232. Monotypic when established.

952. O. SEMPERI LYMAN, 1874. Bull. M. C. Z., **3**, p. 232, pl. 4, f. 11–17.
HOLOTYPE and 10 PARATYPES. PHILIPPINE ISLANDS, 10 fms.

Species of Ophiopsammium not represented in the M. C. Z.

953. O. RUGOSUM Koehler, 1905. Siboga-exp. Oph. litt., p. 116, pl. 13, f. 4–6. Aru Islands, 7 fms.

Ophiogymna.

Ljungman, 1866. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 163.

Type-species: *Ophiogymna elegans* Ljungman, 1866. *loc. cit.* Monotypic when established.

954. O. ELEGANS Ljungman, 1866. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 163. Plate **12**, f. 7, 8.

15 specimens, including 1 cotype, and 1 cotype of *Ophiacampsis inermis* Koehler. Singapore. Hong Kong. Philippine Islands, 6–10 fms. Dutch East Indies: Kei Islands, off Tual, 13 fms.

Species of Ophiogymna not represented in the M. C. Z.

955. O. PELLICULA (Duncan), 1887. Journ. Linn. soc. Zool., **21**, p. 101, pl. 9, f. 20, 21 (*Ophiocampsis*). Mergui Archipelago: King Island.

Genera of Ophiotrichidae not represented in the M. C. Z.

Gymnolophus Brock, 1888. Zeits. f. wiss. zool., **47**, p. 521.

956. Type-species: OPHIOTHELA HOLDSWORTHII E. A. Smith, 1878. Ann. mag. nat. hist., ser. 5, **1**, p. 463. Monotypic. Ceylon.

Ophiolophus Marktanner-Turneretscher, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 314.

957. Type-species: OPHIOLOPHUS NOVARAE Marktanner-Turneretscher, 1887. *loc. cit.*, pl. 13, f. 40, 41. Monotypic. Nicobar Islands.

Ophioaethiops Brock, 1888. Zeits. f. wiss. zool., **47**, p. 524.

958. Type-species: OPHIOAETHIOPS UNICOLOR Brock, 1888. *loc. cit.* Koehler, 1904. Mem. Soc. zool. France, **17**, p. 115, f. 94. Monotypic when established. Amboina.

959. O. ELEGANS (Koehler), 1895. Mem. Soc. zool. France, **8**, p. 405, pl. 9, f. 1, 2 (*Ophiohelix*). Dutch East Indies.

Ophiophthirius Döderlein, 1898. Jena. denkschr., **8**, p. 486.

960. Type-species: OPHIOPHTHIRIUS ACTINOMETRAE Döderleon, 1898. *loc. cit.*, pl. 37, f. 4–4*c*. Monotypic. Torres Strait: Thursday Island.

OPHIOSPHAERA Brock, 1888. Zeits. f. wiss. zool., **47**, p. 526.

961. Type-species: OPHIOSPHAERA INSIGNIS BROCK, 1888. *loc. cit.* KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 116, f. 95, 96. Monotypic. Amboina.

CHILOPHIURIDA.

OPHIOCHITONIDAE.

OPHIOCHITON.

LYMAN, 1878. Bull. M. C. Z., **5**, p. 132.

Type-species: *Ophiochiton fastigatus* LYMAN, 1878. *loc. cit.* Monotypic when established.

962. O. CARINATUS LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 164, pl. 14, f. 1–3.

1 COTYPE. Panama: OFF MARIATO POINT, 322 fms.

963. O. FASTIGATUS LYMAN, 1878. Bull. M. C. Z., **5**, p. 132, pl. 7, f. 182, 183.

9 specimens, including 1 COTYPE. Japan: OFF EASTERN COAST, 94–345 fms.; Uraga Strait, 88 fms.

Species of Ophiochiton not represented in the M. C. Z.

964. O. AMBULATOR KOEHLER, 1897. Ann. sci. nat. Zool., **4**, p. 337, pl. 7, f. 52, 53. Coasts of India, Laccadive and Maldive Islands, 200–890 fms.

965. O. BISPINOSUS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 71, pl. 11, f. 3, 4. Dutch East Indies: Celebes, off Dongala Bay, 365 fms.; north of Lombok, 300 fms.

966. O. COMMIXTUS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 69, pl. 11, f. 1, 2. Dutch East Indies: Strait of Macassar, 723 fms.

967. O. GRANDIS VERRILL, 1884. Amer. journ. sci., ser. 3, **28**, p. 384. Off east coast of United States, 888 fms.

968. O. INAEQUALIS KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 70, pl. 11, f. 5, 6. Dutch East Indies: north of Ceram, 464 fms.

969. O. LENTUS LYMAN, 1879. Bull. M. C. Z., **6**, p. 55, pl. 14, f. 398–400. Near Kermadec Islands, 600 fms.

970. O. SOLUTUS KOEHLER, 1906. Mem. Soc. zool. France, **19**, p. 16, pl. 2, f. 22, 23. Eastern Atlantic, 633–1197 fms.

971. O. TERNISPINUS LYMAN, 1883. Bull. M. C. Z., **10**, p. 255, pl. 5, f. 67–69. Southwest of Ireland, 862 fms.

Ophioplax.

Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 22.

Type-species: *Ophioplax ljungmani* Lyman, 1875. *loc. cit.* Monotypic when established.

972. O. LJUNGMANI Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 22, pl. 2, f. 24, 25.

17 specimens, including HOLOTYPE and 4 PARATYPES. Gulf of Mexico, 101 fms. Off Jamaica, 103 fms. Off St. Cruz, D. W. I., 115 fms. Off Montserrat, 88 fms. Off Dominica, 118 fms. Off Grenada, 262 fms. Off Barbados, 100–123 fms.

973. O. REDUCTA (Koehler).

Ophiopeza reducta Koehler, 1907. Bull. sci., **41**, p. 283, pl. 10, f. 1, 2.
Ophioplax reducta Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 89.

5 specimens. Gulf of Mexico, 101 fms., Blake St. 45. Cuba: off Havana, 80–250 fms. Off St. Vincent, 88 fms.

Species of Ophioplax not represented in the M. C. Z.

974. O. CUSTOS (Koehler), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 321, pl. 6, f. 34, 35 (*Ophiopeza*). Andaman Islands, 45–270 fms.

975. O. LAMELLOSA Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 88. Japan: Sagami Sea, off Kotsujima.

Ophionereis.

Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 110.

Type-species: *Ophiura reticulata* Say, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 148. Type designated by Lyman, 1865.

976. O. ALBOMACULATA E. A. Smith, 1877. Proc. Zool. soc. London, p. 92, pl. 11, f. 1–5.

61 specimens. Galapagos Islands: James Island; Albemarle Island, Iguana Cove.

977. O. ANNULATA (Le Conte).

Ophiolepis annulata Le Conte, 1851. Proc. Acad. nat. sci. Phil., **5**, p. 317.
Ophionereis annulata Lyman, 1860. Proc. Boston soc. nat. hist., **7**, p. 203. McClendon, 1909. Univ. Cal. publ. Zool., **6**, pl. 6, f. 36, 37.

59 specimens, including 9 COTYPES. California: San Diego. Lower California: San Francisquito Bay; Pichilingue Bay; Cape St. Lucas. Mexico: San Josef Island; Mazatlan; Acapulco. Central America, west coast. Panama: Pearl Islands.

978. O. DUBIA (MÜLLER and TROSCHEL).

Ophiolepis dubia MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 94. SAVIGNY, 1809. Descr. de l'Egypte (Audouin), Rayonnes, pl. 1, f. 3^{1}–3^{10}.
Ophionereis dubia LYMAN, 1865. Illus. cat. M. C. Z., no. 1, p. 149.

11 specimens. RED SEA. British East Africa: Mombasa. Zanzibar. Mauritius. Philippine Islands, 30 fms. Japan: mouth of the Bay of Yeddo. Torres Strait: Badu; Friday Island. Queensland: Green Island, near Cairns.

979. O. EURYBRACHYPLAX H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 173, f. 78.

2 PARATYPES. OFF CALIFORNIA, 27 fms. OFF EASTERN JAPAN, 31–41 fms.

980. O. PORRECTA LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 260. 1865. Illus. cat. M. C. Z., no. 1, p. 147, f. 14, 15.

23 specimens, including HOLOTYPE and 3 PARATYPES. Hawaiian Islands: Honolulu, 18 fms.; Maui; Hawaii, Hilo. Fiji Islands. Torres Strait: Murray Islands, Mer.

981. O. RETICULATA (SAY).

Ophiura reticulata SAY, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 148.
Ophionereis reticulata LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 110, pl. 3, f. 6*a*–6*c*.

178 specimens. Bermuda[1]: Fairyland Bay. Bahamas. Florida[1]: Miami; Cape Florida; Key Biscayne; off Carysfort Reef, 35 fms.; Key West; Tortugas. Gulf of Mexico, 37–110 fms. West Indies[1]: Jamaica: Montego Bay; Port Antonio; Kingston. St. Thomas, D. W. I. Off Montserrat, 88 fms. Venezuela: Bay of Cumana. Brazil: off Cape Frio, 35 fms.; Rio Janeiro; Rat Island.

982. O. SCHAYERI (MÜLLER and TROSCHEL). Plate **13**, f. 1, 2.

Ophiolepis schayeri MÜLLER and TROSCHEL, 1844. Arch. naturg., **10**, p. 182.
Ophionereis schayeri LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 110.

25 specimens. New South Wales: Port Jackson. Victoria: Western-port. Australia: Bass Strait, 38–40 fms. New Zealand: Dunedin; Wellington. Juan Fernandez.

Species of Ophionereis not represented in the M. C. Z.

983. O. FUSCA BROCK, 1888. Zeits. f wiss. zool., **47**, p. 492. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 72, f. 27. Amboina.

984. O. NUDA LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 163, pl. 14, f. 7–9. Gulf of Panama, 85 fms. Galapagos Islands, 53 fms.

985. O. OLIVACEA H. L. CLARK, 1901. Bull. U. S. fish comm., **2**, p. 248, pl. 14, f. 10–13. Porto Rico: eastern coast, 6 fms.

[1] Without definite locality.

986. O. SEMONI (Döderlein), 1896. Jena. denkschr., **8**, p. 288, pl. 15, f. 8, 8a (*Ophiotriton*). Torres Strait: Thursday Island.

987. O. SOPHIAE Brock, 1888. Zeits. f. wiss. zool., **47**, p. 490. Koehler, 1905. Siboga-exp. Oph. litt., pl. 6, f. 5, 6. Amboina.

988. O. SQUAMULOSA Koehler, 1914. Bull. 84 U. S. N. M., p. 44. 1913. Zool. jahrb. Suppl., **11**, p. 360, pl. 21, f. 4–6 (as *O. squamata*). St. Thomas, D. W. I. Brazil: off Parahiba, 20 fms.

Ophiodoris.

Koehler, 1904. Siboga-exp. Oph. mer prof., p. 72.

Type-species: *Ophiodoris malignus* Koehler, 1904. *op. cit.*, p. 73. Type here first designated.

989. O. PERICALLES H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 177, f. 80.

3 paratypes. Japan: southwest of Goto Islands, 95 fms.; off Kagoshima Gulf, 103 fms.

Species of Ophiodoris not represented in the M. C. Z.

990. O. CONTRARIUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 75, pl. 12, f. 3, 4. East Indian region, 643–723 fms.

991. O. ERRANS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 74, pl. 12, f. 1, 2. Dutch East Indies: Kei Islands, 331 fms.

992. O. MALIGNUS Koehler, 1904. Siboga exp. Oph. mer prof., p. 73, pl. 12, f. 5, 6. Sulu Archipelago, 250 fms. Dutch East Indies: off Waigeu, 261 fms.

Ophiocrasis.

H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 175.

Type-species: *Ophiocrasis dictydisca* H. L. Clark, 1911. *loc. cit.* Type designated.

993. O. DICTYDISCA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 175, f. 79.

1 paratype. Korea Strait, 59 fms.

994. O. MARKTANNERI Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 90. Marktanner-Turneretscher. 1887. Ann. K. K. naturh. Hofmus., **2**, p. 302, pl. 12, f. 18 (as *Ophionereis porrecta*).

1 cotype. Japan: Misaki, Arai Beach.

OPHIOCOMIDAE.

Ophiocoma.

L. Agassiz, 1835. Mem. Soc. sci. nat. Neuchatel, **1**, p. 192.

Type-species: *Ophiura echinata* Lamarck, 1816. Anim. sans Vert., **2**, p. 543. Type determined by the fact that Agassiz mentions but two species and *echinata* alone is identifiable.

995. O. AETHIOPS LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 141, 145. Plate **13**, f. 6, 7.

180 specimens. Lower California: Cape St. Lucas; Puerto Balandre. Mexico: Mazatlan; Acapulco. PANAMA. Galapagos Islands: James Island; Albemarle Island.

996. O. ALEXANDRI LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 256. Plate **16**, f. 5, 6.

20 specimens, including HOLOTYPE and 6 PARATYPES. Lower California: CAPE ST. LUCAS; Angeles Bay; San Francisquito Bay. Mexico: Mazatlan; ACAPULCO. Panama. Pearl Islands.

997. O. BREVIPES PETERS, 1851. Monatsb. K.-Preus. akad. wiss. Berlin, p. 465. E. A. SMITH, 1876. Philos. trans., **168**, pl. 51, f. 1, 2 (as *O. variegata* and *O. brevispinosa*).

176 specimens. Zanzibar. Mauritius. Philippine Islands. Amboina. New Guinea: Sorong. Torres Strait: Erub; Murray Islands, Mer. Queensland: Green Island, near Cairns. Lord Howe Island. Fiji Islands: Viti Levu, Suva Reefs. Gilbert Islands. Caroline Islands: Ponape. Pelew Islands. Hawaiian Islands [1]: Hawaii, Hilo.

998. O. CANALICULATA LÜTKEN, 1869. Add. ad hist. Oph., pt. 3, p. 46, 99. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 75, f. 30–32.

1 specimen. Victoria: Westernport.

999. O. ECHINATA (LAMARCK).

Ophiura echinata LAMARCK, 1816. Anim. sans Vert., **2**, p. 543.

Ophiocoma echinata L. AGASSIZ, 1835. Mem. Soc. sci. nat. Neuchatel, **1**, p. 192. LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, pl. 4, f. 7*a*–7*d*.

322 specimens: Bermuda [1]: Hungry Bay; Sticky Bay. Bahamas. Florida [1]: Cape Florida; Bush Key; Key West; Tortugas. West Indies.[1] Haiti [1]: Caymites; Jeremie. Jamaica [1]: Montego Bay; Port Antonio; Drunkenman Cay; Kingston. St. Thomas, D. W. I. Panama: Aspinwall. Venezuela: Cumana.

1000. O. ERINACEA MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 98. Plate **15**, f. 5, 6.

125 specimens. MOZAMBIQUE. Zanzibar. Mauritius. Seychelle Islands. Philippine Islands. Amboina. Torres Strait: Murray Islands, Mer. Lord Howe Island. Pelew Islands. Caroline Islands: Ponape. Gilbert Islands. Marshall Islands. Society Islands. Hawaiian Islands [1]: Hawaii, Hilo.

1001. O. INSULARIA LYMAN, 1861. Proc. Boston soc. nat. hist., **8**, p. 80. Plate **15**, f. 3, 4.

28 specimens. Hawaiian Islands [1]: Hawaii, Hilo; Maui, Lahaina. Society Islands. Japan: Tanegashima.

[1] Without definite locality.

1002. O. PARVA, sp. nov. Plate 14, f. 8, 9.

Disk, 5 mm. in diameter; arms *six*, 20 mm. long. Disk covered with rather widely spaced, elongated granules; that is, granules which are distinctly higher than thick; in some the vertical diameter is at least twice the horizontal. No radial shields visible. Upper arm-plates about as long as wide; distal half of margin is a semicircle, proximal half, trigonal with proximal side much the shortest; plates in contact only for width of short proximal margin. Interbrachial areas below covered with a coat of delicate scales which carry a very few elongated granules. Oral shields rounded pentagonal, rather longer than wide. Adoral plates small, trigonal, not meeting within. Oral papillae 4 on each side, the innermost smallest, the ultimate or penultimate the largest. Tooth-papillae only 3 or 4. Under arm-plates somewhat octagonal with rounded angles and the lateral margins much the longest; they are longer than wide and distally become about twice as long as wide; they are in contact for only the width of the proximal side. Side arm-plates rather large; each carries 4 arm-spines, of which the uppermost is longest, exceeding an arm-joint; spines tapering but blunt, and none are club-shaped, thickened or in any way peculiar. Tentacle-scale single, rather large, rounded on the proximal joints but becoming pointed distally. Color (dried from formalin):—disk, light greenish brown, variegated with pearl-gray; dorsal surface of arms very light yellowish with bands of light brown every three or four joints; these bands are not well-defined and cover 1–1½ upper arm-plates; lower surface very pale yellowish, the interbrachial areas pearl-gray.

Holotype (M. C. Z. 3758) and 25 paratypes (M. C. Z. 3759, 3855). Torres Strait: Murray Islands, Mer. October, 1913. Carnegie Exp. 1913. H. L. Clark coll.

When this species was first observed on the reefs at Mer, it was supposed to be the young of *Ophiocoma brevipes* but later when the young of that species were found it was noted that even the smallest have only *five* arms and possess 2 tentacle-scales. Further study proved that this six-armed form, although showing such juvenile characters in many ways, is not the young of any of the known species of Ophiocoma or Ophiomastix. The specimens were found usually associated with *Ophiactis savignyi* on the under surface of rock fragments, or in the crevices of sponges and corals. The coloration in life is much like that of the Ophiactis (green and white) and specimens of the same size are easily confused.

1003. O. PICA Müller and Troschel, 1842. Syst. Ast., p. 101.

33 specimens. Java. Torres Strait: Murray Islands, Mer. Gilbert Islands. Society Islands. Hawaiian Islands [1]: Maui; Hawaii, Hilo.

1004. O. PUMILA Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 141, 146, pl. 4, f. 5*a*–5*d*.

70 specimens. Bermuda (?). Florida [1]: Cape Florida; Key West; Tortugas. Cuba: Cruz de Padre Reef. Jamaica: Pedro Bank, 4 fms.; Montego Bay; Port Antonio. Haiti: Caymites; Jeremie. West Indies [1]. St. Thomas, D. W. I. Cape Verde Islands.

1005. O. RIISEI Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 141, 143, pl. 4, f. 6*a*–6*d*.

118 specimens. Bermuda: Hungry Bay. Bahamas. Florida [1]: Cape Florida; Key West; Tortugas. Jamaica: Montego Bay; Port Antonio. Swan Island. Haiti: Caymites; Jeremie. St. Thomas, D. W. I. Venezuela: Cumana.

1006. O. SCHOENLEINII Müller and Troschel, 1842. Syst. Ast., p. 99. Plate **15**, f. 1, 2.

22 specimens. Amboina. Torres Strait: Murray Islands, Mer. Queensland: Green Island near Cairns.

1007. O. SCOLOPENDRINA (Lamarck). Plate **14**, f. 10, 11.

Ophiura scolopendrina Lamarck, 1816. Anim. sans Vert., **2**, p. 544.
Ophiocoma scolopendrina Müller and Troschel, 1842. Syst. Ast., p. 101.

266 specimens. Cape of Good Hope. Mozambique. Zanzibar. Madagascar. Arabian Gulf. Philippine Islands [1]: Luzon, La Union. Halmaheira. Amboina. New Guinea [1]: Sorong. Torres Strait: Murray Islands, Mer. New Hebrides: Espiritu Santo, Tangoa. Pelew Islands. Caroline Islands: Ponape; Strongs Island. Marshall Islands [1]: Ebon. Gilbert Islands. Fiji Islands: Viti Levu, Suva Reefs; Nukulau Islet; Manuku Levu Islet. Society Islands.

1008. O. VALENCIAE Müller and Troschel, 1842. Syst. Ast., p. 102. Plate **16**, f. 7, 8.

12 specimens. Mozambique. Querimba Island. Zanzibar.

Species of Ophiocoma not represented in the M. C. Z.

1009. O. BOLLONSI Farquhar, 1908. Trans. N. Z. inst., **40**, p. 108. New Zealand: between Stephen Island and mainland, 16 fms.

1010. O. LUBRICA Koehler, 1898. Bull. sci., **31**, p. 77, pl. 3, f. 23, 24. Laccadive Islands, 30–50 fms.

[1] Without definite locality.

1011. O. MARMORATA Marktanner-Turneretscher, 1887. Ann. K. K. naturh. Hofmus. Wien, **2**, p. 303, pl. 12, f. 16, 17. "0.7° N. × 23°–25° W." No depth given but this locality is mid-Atlantic!

1012. O. WENDTII Müller and Troschel, 1842. Syst. Ast., p. 99. Koehler, 1907. Bull. sci., **41**, p. 327, pl. 13. f. 38. Loc.?

Ophiopteris.

E. A. Smith, 1877. Ann. mag. nat. hist., ser. 4, **19**, p. 306.

Type-species: *Ophiopteris antipodum* E. A. Smith, 1877. *loc. cit.* Monotypic when established.

1013. O. ANTIPODUM E. A. Smith, 1877. Ann. mag. nat. hist., ser. 4, **19**, p. 306, pl. 15.

2 specimens. New Zealand: Wellington, Island Bay.

1014. O. PAPILLOSA (Lyman).

Ophiocoma papillosa Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 11.
Ophiopteris papillosa McClendon, 1909. Univ. Cal. publ. Zool., **6**, p. 49, pl. 5, f. 28, 29.

3 specimens, including HOLOTYPE and 1 PARATYPE. California: Monterey, 8–12 fms.; 5 MILES SOUTH OF SANTA BARBARA, 22 fms.

Ophiomastix.

Müller and Troschel, 1842. Syst. Ast., p. 84, 107.

Type-species: *Ophiura annulosa* Lamarck, 1816. Anim. sans Vert., **2**, p. 543. Monotypic when established.

1015. O. ANNULOSA (Lamarck).

Ophiura annulosa Lamarck, 1816. Anim. sans Vert., **2**, p. 543.
Ophiomastix annulosa Müller and Troschel, 1842. Syst. Ast., p. 107. Döderlein, 1896. Jena. denkschr., **8**, pl. 16, f. 11.

62 specimens. Ceylon. Keeling Islands. Philippine Islands. Pelew Islands. Amboina. Torres Strait: Murray Islands, Mer.

1016. O. ASPERULA Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 43. Koehler, 1905. Siboga-exp. Oph. litt., pl. 6, f. 11, 12.

5 specimens. Zanzibar. Torres Strait: Murray Islands, Mer. Fiji Islands.

1017. O. CARYOPHYLLATA Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 43. Döderlein, 1896. Jena. denkschr., **8**, pl. 15, f. 10, 10*a*.

24 specimens. Torres Strait: Murray Islands, Mer. Fiji Islands.

1018. O. CORALLICOLA, sp. nov. (*corallum*, coral + *colo*, to dwell in). Plate **16**, f. **1**, 2.

Disk, 18 mm. in diameter; arms 90 mm. long. Disk covered with spine-bearing scales, which are more or less concealed by the skin; the spines are

numerous, a millimeter long or more, slender but not acicular. No radial shields are visible. Upper arm-plates diamond-shaped, nearly twice as wide as long, more or less in contact. Interbrachial areas below show the fine scaling much more clearly than the disk and carry few spines. Oral shields longer than wide, octagonal with corners rounded, especially proximally; disto-lateral margins each with a low conical spinelet. Adoral plates trigonal, the side adjoining oral shield much the longest. Oral papillae 4–5, on a side, the two distalmost largest. Tooth-papillae small and numerous, 15–18 on each jaw tip. Under arm-plates much wider than long, broadly in contact; the true outlines are obscured by the peculiar coloration; they are broadly octagonal with distal corners rounded. Side arm-plates not prominent; each carries a series of 3 or 4 spines, the uppermost longest; when there are 4 the uppermost may exceed 5 joints and is frequently very thick and often clavate. These stout spines occur at intervals of 2–6 joints and alternate on the two sides of the arm. Tentacle-scales 2, rather large, flat and rounded but longer than wide. Color (dried): — disk, brownish gray with numerous spots and small blotches of blackish; disk spines gray with two or three rings of light brown; upper arm-plates and distal half of side arm-plates gray; proximal half of side arm-plates blackish, in marked contrast; stout arm-spines dark gray; other arm-spines light gray annulated with brownish; interbrachial areas below gray with blackish spots; oral shields gray, but a conspicuous blackish band across the surface of the jaw includes the proximal end; under arm-plates pale gray but their distal margins on each side are invaded by the black of the side arm-plates, obscuring their real outlines; tentacle-scales very light.

Holotype (M. C. Z. 3775) and 40 paratypes (M. C. Z. 3373, 3374, 3862). Torres Strait: Murray Islands, Mer. October, 1913. Carnegie Exp. 1913. H. L. Clark coll.

This is one of the common brittle-stars in the dead coral on the southeastern reef-flat at Mer. It occurs in company with *O. caryophyllata* and the much rarer *O. asperula*. Although at first glance very similar to *caryophyllata*, comparison of two specimens shows that they are perfectly distinct. The shape of the upper arm-plates is an important feature, in which they differ constantly, while the difference in color-pattern is very striking and surprisingly constant. In scores of specimens examined, of widely diverse ages and sizes, I never saw a specimen which could be considered an intermediate between the two species. These ophiurans are very active, keeping constantly in among the coral branches (hence the name) and never occurring on the sand, under coral fragments, where

O. annulosa is abundant. They are readily found by breaking up the masses of closely branched corals growing on the reef-flat in shallow water.

1019. O. FLACCIDA LYMAN, 1874. Bull. M. C. Z., **3**, p. 226, pl. 6, f. 14, 15.

12 specimens, including HOLOTYPE and 10 PARATYPES. PHILIPPINE ISLANDS. Torres Strait: Murray Islands, Mer.

1020. O. JANUALIS LYMAN, 1871. Illus. cat. M. C. Z., no. 6, p. 14, pl. 1, f. 13, 14.

25 specimens, including HOLOTYPE.[1] Philippine Islands: Cebu Reefs. Torres Strait: Murray Islands, Mer.

1021. O. LÜTKENI PFEFFER, 1900. Abh. Senckenb. nat. ges., **25**, p. 83. Plate **16**, f. 3, 4.

1 specimen. Japan: Riu Kiu Islands, Okinawa.

1022. O. MIXTA LÜTKEN, 1869. Add. ad. hist. Oph., pt. 3, p. 42. KOEHLER, 1905. Siboga-exp. litt., pl. 6, f. 15; pl. 15, f. 1.

74 specimens. Japan: Bay of Yeddo. Torres Strait: Murray Islands, Mer. Fiji Islands. SAMOA.

1023. O. VENOSA PETERS, 1851. Monats. K.-Preus. akad. wiss. Berlin, p. 464. KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 73, f. 28, 29.

13 specimens. Zanzibar.

Species of Ophiomastix not represented in the M. C. Z.

1024. O. ELEGANS BROCK, 1888. Zeit. f. wiss. zool., **47**, p. 500. Amboina.

1025. O. ORNATA KOEHLER, 1905. Siboga-exp. Oph. litt., p. 71, pl. 6, f. 13, 14. Dutch East Indies: Borneo Bank, 19 fms.

1026. O. PUSILLA BROCK, 1888. Zeit. f. wiss. zool., **47**, p. 499. KOEHLER, 1905. Siboga-exp. Oph. litt., pl. 6, f. 9, 10; pl. 13, f. 3. Amboina.

1027. O. VARIABILIS KOEHLER, 1905. Siboga-exp. Oph. litt., p. 69, pl. 6, f. 16, pl. 16, f. 3, 4. Dutch East Indies: four widely separated stations, 6–18 fms.

OPHIARTHRUM.

PETERS, 1851. Monatsb. K.-Preus. akad. wiss. Berlin, p. 463.

Type-species: *Ophiarthrum elegans* PETERS, 1851. *op. cit.*, p. 464. Monotypic when established.

1028. O. ELEGANS PETERS, 1851. Monatsb. K.-Preus. akad. wiss. Berlin, p. 464. KOEHLER, 1898. Bull. sci. **31**, pl. 3, f. 25, 26.

54 specimens. Zanzibar. Philippine Islands: Surigoo Strait. New

[1] The holotype is a very young specimen of this fine species and is labeled: "Mexilones, Bolivia. Capt. Putnam." There is no doubt that this locality is an error. Capt. Putnam brought many specimens to the Museum from Hong Kong and this specimen may be from there.

Guinea: Sorong. Torres Strait: Friday Island; Erub; Murray Islands, Mer. Queensland: Green Island near Cairns. Pelew Islands. Caroline Islands: Ponape. Society Islands: Papeete.

1029. O. PICTUM (Müller and Troschel).
Ophiocoma picta Müller and Troschel, 1842. Syst. Ast., p. 102.
Ophiarthrum pictum Lyman, 1874. Bull. M. C. Z., **3**, p. 225, pl. 7, f. 2–4.

33 specimens. Philippine Islands, 3–30 fms. Torres Strait: Murray Islands, Mer. Pelew Islands.

Species of Ophiarthrum not represented in the M. C. Z.

1030. O. LYMANI de Loriol, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 34, pl. 24, f. 2–2*d*. Mauritius.

Ophiopsila.

Forbes, 1843. Trans. Linn. soc., **19**, p. 149.

Type-species: *Ophiopsila aranea* Forbes, 1843. *loc. cit.* Monotypic when established.

1031. O. ARANEA Forbes, 1843. Trans. Linn. soc., **19**, p. 149, pl. 14, f. 1–7.

7 specimens. Algeria. Naples. Adriatic Sea.

1032. O. FULVA Lyman, 1878. Bull. M. C. Z., **5**, p. 227, pl. **2**, f. 25–27.

Holotype. Cuba: off Havana, 175 fms.

1033. O. HARTMEYERI Koehler, 1913. Zool. jahrb. Suppl., **11**, p. 368, pl. 21, f. 7, 8.

6 specimens. Florida: off French Reef, 15 fms. Off Montserrat, 88 fms. Off Barbados, 69 fms. Brazil: off Abrolhos, 30 fms.

1034. O. POLYACANTHA, sp. nov. (πολύς, many + ἄκανθα, spine). Plate **14**, f. 6, 7.

Disk 6.5 mm. in diameter; arms about 35 mm. long. Similar to *O. pantherina* Koehler in many features but quite different in arm-spines and color. The arms also are relatively shorter being only 5–6 times the disk-diameter instead of 8–9 times. There are 10–11 arm-spines on each joint (hence the name) even far out on the arm; the lowest is the longest and nearly or quite equals two arm-joints; the next one is noticeably shorter; the middle ones are shortest, scarcely equalling a joint; the upper ones exceed a joint and are the flattest and broadest spines in the series; all the spines (except the uppermost one or two) are slender and the middle ones are very slender and bluntly pointed. Color (dried): — disk very light with scattered spots and small blotches of pale

brown; some of the blotches have an orange tinge; arms yellowish white or dirty whitish with about a dozen widely spaced narrow dusky bands.

Holotype (M. C. Z. 3503). Dutch East Indies: Strait of Macassar, Borneo Bank, 33 fms. Siboga Station 77.

This specimen was sent to the Museum by the Amsterdam Museum as *O. pantherina* Koehler. Noting, however, that Koehler does not record *pantherina* from Station 77, I examined the specimen critically and decided that the large number of arm-spines absolutely forbade its being assigned to Koehler's species. In the *number* of arm-spines, this specimen is much like *O. fulva* Lyman but the spines are so much more slender, the general appearance of the arm is very different. In coloration also this species is much more like *fulva* than like *pantherina*, but in the mouth-parts it is nearer the latter species.

1035. O. POLYSTICTA, sp. nov. (*πολύστικτος*, with many spots). Plate 14, f. 3–5.

Disk 6 mm. in diameter; arms about 50 mm. long. Disk covered with a coat of very fine scales as usual in the genus. Radial shields long and very narrow, completely separated from each other, parallel or converging distally. Upper arm-plates squarish with rounded corners, about as wide as long, broadly in contact or even somewhat overlapping. Oral shields rounded pentagonal, a trifle wider than long. Adoral plates insignificant. Oral papillae two on each side, large, longer than wide. Tooth-papillae small and numerous. Under arm-plates squarish, about as wide as long. Side arm-plates small, each with 6 slender spines, of which the lowest is longest and considerably exceeds the joint; uppermost shortest but it and the next one are stouter than the two following. Tentacle-scales very long and flat, as usual; near middle of arm, they are longer than the width of the arm. Color (dried):—disk whitish variegated with olive; radial shields white, the scales between and on either side dark olive; upper arm-plates gray, as a rule, but at intervals of from 2 to 5 joints are whitish plates; upper ends of side arm-plates deep olive, forming a narrow and somewhat broken line along each margin of the upper arm-surface; there is a deep olive spot (not sharply defined) at the juncture of every two upper arm-plates (hence the name), half on the distal margin of one and half on the proximal margin of the other; arm-spines and lower surface whitish; on each adoral plate and on the jaw-surface, just proximal to oral shield are olive spots (3 to each mouth angle); near the disk, the lower end of the side arm-plate forms a dark spot on each side of the arm-joint.

Holotype (M. C. Z. 1566). Off Barbados, 7½–50 fms. Blake Station 287.

This specimen is labeled *Ophiopsila riisei* but I feel sure it is not that species. The markings of the upper surface of the arm are suggestive of those shown by *O. hartmeyeri*, but the coloration is otherwise so totally different, there is no reason for considering the fact significant. Aside from color, *polysticta* differs from *hartmeyeri* in narrower arm-plates, both upper and lower, and in more slender arm-spines.

1036. O. RIISEI Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 136, pl. 5, f. 2*a*–2*c*.

65 specimens. Bahamas: Orange Key. Florida[1]: Cape Florida; Key West. Gulf of Mexico, 37 fms. Haiti. Barbados, 13–40 fms.

Species of Ophiopsila not represented in the M. C. Z.

1037. O. ANNULOSA (Sars), 1857. Nyt. mag. naturvid., **10**, p. 83, pl. 1, f. 2–7 (*Ophianoplus*). Mediterranean Sea.

1038. O. MACULATA (Verrill), 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 55, pl. 3, f. 4, 4*a* (*Amphipsila*). Cuba: off Havana, 200 fms.

1039. O. PANTHERINA Koehler, 1898. Bull. sci., **31**, p. 72, pl. 3, f. 15, 16. Mergui Archipelago, 4–35 fms.

1040. O. PAUCISPINA Koehler, 1907. Bull. sci., **41**, p. 314, pl. 11, f. 26. Mozambique: Fernão Veloso Bay.

OPHIODERMATIDAE.

Ophiarachna.

Müller and Troschel, 1842. Syst. Ast., p. 84, 104.

Type-species: *Ophiura incrassata* Lamarck, 1816. Anim. sans Vert., **2**, p. 542. Type designated by Lütken, 1869.

1041. O. AFFINIS Lütken, 1869. Add. ad hist. Oph., pt. 3, p. 34, 98. Plate **18**, f. 1, 2.

1 specimen. Samoa.

1042. O. INCRASSATA (Lamarck).

Ophiura incrassata Lamarck, 1816. Anim. sans Vert., **2**, p. 542.

Ophiarachna incrassata Müller and Troschel, 1842. Syst. Ast., p. 104. Herklots, 1869. Echinod. peintes d'apres nature, pl. 6, (colored).

25 specimens. Philippine Islands. Amboina. Torres Strait: Erub; Murray Islands, Mer. Pelew Islands. Fiji Islands (or Samoa?). Caroline Islands: Kusaie.

[1] Without definite locality.

Species of Ophiarachna not represented in the M. C. Z.

1043. O. MAURITIENSIS DE LORIOL, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 32, pl. 24, f. 1–1*e*. Mauritius.

1044. O. ROBILLARDI DE LORIOL, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 31, pl. 23, f. 5–5*e*. Mauritius.

OPHIODERMA.

MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 83, 86.

Type-species: *Asterias longicauda* RETZIUS, 1805. Diss. Ast., p. 28. Type here first definitely designated.

1045. O. APPRESSUM (SAY).

Ophiura appressa SAY, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 151.

Ophioderma appressa LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 86, pl. 1, f. 4*a*–4*d* (as *O. virescens*).

261 specimens. Bermuda: Coney Island. Bahamas. South Carolina: Charleston. FLORIDA [1]: Aurelia Island; Cape Florida; Key West; Tortugas. Jamaica: Montego Bay; Port Antonio; Port Royal. Haiti: Jeremie; Port au Prince. St. Thomas, D. W. I. Venezuela; Bay of Cumana. Brazil: Porto Seguro; Victoria.

1046. O. BREVICAUDUM LÜTKEN, 1856, Vid. med., p. 8. 1859. Add. ad. hist. Oph., pt. 2, p. 94, pl. 1, f. 3*a*–3*c*.

64 specimens. Bahamas. Florida: Tortugas. Jamaica: Montego Bay; Port Antonio; near Port Royal. Haiti: Port au Prince. ST. THOMAS, D. W. I. Guadeloupe.

1047. O. BREVISPINUM (SAY).

Ophiura brevispina SAY, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 149.

Ophioderma brevispina LÜTKEN, 1859. Add. ad hist. Oph., pt. 2, p. 86, pl. 1, f. 6*a*–6*c* (as *O. serpens*).

622 specimens. Massachusetts: North Falmouth; New Bedford; Dartmouth. Connecticut: Sag Harbor. North Carolina: Beaufort. Georgia: Fort Macon. FLORIDA [1]: Miami; West Coast; Pensacola; Charlotte Harbor; Cape Florida; off Garden Key, 63 fms.; Cedar Keys; off French Reef, 44 fms.; off Carysfort Reef, 63 fms.; Key West; Tortugas. Gulf of Mexico, 36 fms. Cuba: Guadiana Bay. Jamaica [1]: Montego Bay; Port Antonio: Port Royal. St. Thomas, D. W. I. St. Cruz, D. W. I., Flannegans Passage, 27 fms. Haiti: Port au Prince.

[1] Without definite locality.

1048. O. CINEREUM Müller and Troschel, 1842. Syst. Ast., p. 87. Lütken, 1859. Add. ad hist. Oph., pt. 2, pl. 1, f. 1*a*–1*c* (as *O. antillarum*).

80 specimens. Bahamas. Florida[1]: Cape Florida: Carysfort Reef; Tortugas. Cuba: Coutoy. Jamaica[1]: Montego Bay; Port Royal. Haiti: Jeremie; Port au Prince. St. Thomas, D. W. I. Barbados, 69–94 fms. Mexico: south of Vera Cruz. Panama: Aspinwall. Brazil: off Bahia, 75 fms.; Porto Seguro.

1049. O. ELAPS Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 93. Koehler, 1914. Bull. 84 U. S. N. M., pl. 1, f. 1, 2, pl. 18, f. 4, pl. 18, f. 2, 6 (as *O. clypeata*).[2]

3 specimens. Off Isle of Pines, 300 fms. Off Montserrat, 120 fms. Off the Grenadines, 163 fms.

1050. O. GUTTATUM Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 95, pl. 1, f. 8*a*, 8*b*.

2 specimens. Jamaica: Montego Bay, Umbrella Point; Port Antonio, Titchfield Reef.

1051. O. HOLMESII (Lyman).

Ophiura holmesii Lyman, 1860. Proc. Bost. soc. nat. hist., **7**, p. 255. 1865. Illus. cat. M. C. Z., no. 1, pl. 1, f. 7 (colored).

Ophioderma holmesi Meissner, 1901. Bronn's thierreichs, **2**, abt. 3, p. 915.

Holotype and 7 paratypes. South Carolina: Charleston; Sullivan's Island.

1052. O. JANUARII Lütken, 1856. Vid. med., p. 7, 1859. Add. ad hist. Oph., pt. 2, pl. 1, f. 5*a*–5*c*.

5 specimens. Brazil[1]: Rio Janeiro.

1053. O. LONGICAUDUM (Retzius).

Asterias longicauda Retzius, 1805. Diss. Ast., p. 28.

Ophioderma longicaudum Müller and Troschel, 1842. Syst. Ast., p. 86, pl. 9, f. 1.

127 specimens. Azores[1]: Fayal. Spain. Mediterranean Sea. Nice. Naples. Messina. Trieste. Malta. Algeria: Algiers.

1054. O. PANAMENSE Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 91. H. L. Clark, 1910. Bull. M. C. Z., **52**, pl. 8, f. 2.

62 specimens. California: La Jolla; San Diego. Lower California:

[1] Without definite locality.

[2] Courtesy to Dr. Koehler demands that I should give the reasons for considering his recently described species *clypeata* identical with *elaps*. Our specimens include one from the same station as his single specimen of *clypeata*. It agrees in the form of the under arm-plates with *clypeata* but in other respects is like his description and figures of *elaps*. Our other two specimens also combine the characters supposed to distinguish the two species. Not one of our specimens has oral shields exactly like those of Koehler's type and the latter must be considered as simply an individual variant of *elaps*.

Sequina Bay; Cape St. Lucas; Pichilingue Bay; Puerto Balandre. Mexico: Mazatlan; Acapulco. PANAMA. Pearl Islands. Peru: Payta.

1055. O. RUBICUNDUM LÜTKEN, 1856. Vid. med., p. 8, 1859. Add. ad hist. Oph., pt. 2, pl. 1, f. 2*a*–2*c*.

10 specimens. Bahamas: off Orange Key, 9 fms. Florida: Cape Florida. St. Thomas, D. W. I.

1056. O. TERES (LYMAN).

Ophiura teres LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 198. 1865. Illus. cat. M. C. Z., no. 1, p. 37, f. 1.

Ophioderma teres MEISSNER, 1901. Bronn's thierreichs, **2**, abt. 3, p. 915.

12 specimens. Mexico: Acapulco. PANAMA. Pearl Islands. Galapagos Islands.

1057. O. VARIEGATUM LÜTKEN, 1856. Vid. med., p. 21. Plate **18**, f. 7, 8.

14 specimens. California: San Diego. Lower California: Puerto Balandre; Aqua Verde Bay. Panama. Pearl Islands.

Species of Ophioderma not represented in the M. C. Z.

1058. O. LEONIS DÖDERLEIN, 1910. Schultze's Zool. anthr. Ergeb., **4**, lfg. 1, p. 252, pl. 5, f. 1, 1*a*. Southwest Africa: Lüderitz Bay.

1059. O. PALLIDUM (VERRILL), 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 7, pl. 2, f. 3 (*Ophiura*). Cuba: off Havana, 110–200 fms.

1060. O. PROPINQUUM KOEHLER, 1895. Mem. Soc. zool. France, **8**, p. 404, pl. 9, f. 5. East Indies.

1061. O. SQUAMOSISSIMUM LÜTKEN, 1856. Vid. med., p. 8, 1859. Add. ad hist. Oph., pt. 2, pl. 1, f. 7*a*, 7*b*. West Indies.

1062. O. TONGANUM LÜTKEN, 1872. Ov. Kongl. Danske vid. selsk. Forh., p. 76, 106. Tonga Islands.

1063. O. WAHLBERGII MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 87. Natal: Port Natal.

DIOPEDERMA.

H. L. CLARK, 1913. Bull. Amer. mus. nat. hist., **32**, p. 206.

Type-species: *Ophiura daniana* VERRILL, 1867. Trans. Conn. acad., **1**, p. 254. Type designated.

1064. D. AXIOLOGUM H. L. CLARK, 1913. Bull. Amer. mus. nat. hist., **32**, p. 206, pl. 45, f. 5–7.

1 PARATYPE, Lower California: Cape St. Lucas.

Species of Diopederma not represented in the M. C. Z.

1065. D. DANIANUM (VERRILL), 1867. Trans. Conn. acad., **1**, p. 254 (*Ophiura*). San Salvador: La Union, 7 fms.

Pectinura.

Forbes, 1843. Trans. Linn. soc. London, **19**, p. 144.

Type-species: *Pectinura vestita* Forbes, 1843. *op. cit.*, p. 145. Monotypic when established.

1066. P. ANCHISTA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 23, f. 1.

2 paratypes. Japan: off Suno Saki, 49 fms.

1067. P. ARENOSA Lyman, 1879. Bull. M. C. Z., **6**, p. 48, pl. 14, f. 392–394.

1 cotype. Australia: Bass Strait, 38–40 fms.

1068. P. ASSIMILIS (Bell).

Ophiopeza assimilis Bell, 1888. Proc. Zool. soc. London, p. 282, pl. 16, f. 5.
Pectinura assimilis H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 118.

1 specimen. South Australia?

1069. P. CYLINDRICA (Hutton). Plate **17**, f. 4, 5.

Ophiura cylindrica Hutton, 1872. Cat. N. Z. Ech., p. 3.
Pectinura cylindrica H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 117.

6 specimens. New Zealand: Dunedin; Wellington, Island Bay.

1070. P. DYSCRITA H. L. Clark, 1909. Mem. Austr. mus., **4**, p. 534, pl. 49, f. 5–7.

1 paratype. New South Wales: off Wollongong, 55–56 fms.

1071. P. FALLAX (Peters). Plate **18**, f. 9, 10.

Ophiopeza fallax Peters, 1851. Monatsb. K.-Preus. akad. wiss. Berlin, p. 465.
Pectinura fallax H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 119.

9 specimens. Zanzibar.

1072. P. MACULATA (Verrill).

Ophiarachna maculata Verrill, 1869. Proc. Boston soc. nat. hist., **12**, p. 388.
Pectinura maculata Verrill, 1869. Amer. jour. sci., ser. 2, **48**, p. 431 (footnote). Koehler, 1907. Bull. sci., **41**, pl. 10, f. 3, 4.

3 specimens. New Zealand: Queen Charlotte Sound; Stewart Island.

1073. P. YOLDII (Lütken), 1856.

Ophiopeza yoldii Lütken, 1856. Vid. med., p. 9. 1859. Add. ad hist. Oph., pt. 2, pl. 1, f. 9.
Pectinura yoldii H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 119.

6 specimens. Philippine Islands: Pandanoa. Dutch East Indies: Sapeh Strait, 38 fms. Queensland: Port Denison; Port Molle.

Species of Pectinura not represented in the M. C. Z.

1074. P. AEQUALIS (Lyman), 1880. Anniv. mem. Boston soc. nat. hist., p. 9, pl. 2, f. 23–25 (*Ophiopeza*). Northeast of New Guinea, 152 fms.

1075. P. EXILIS (KOEHLER), 1905. Siboga-exp. Oph. litt., p. 12, pl. 2, f. 5, 6, 8 (*Ophiopeza*).[1] Dutch East Indies, 46–70 fms.

1076. P. VESTITA FORBES, 1843. Trans. Linn. soc. London, **19**, p. 145, pl. 13, f. 1–7. Aegean Sea.

OPHIOPEZELLA.

LJUNGMAN, 1871. Öfv. Kongl.-Vet. akad. Förh., **28**, p. 639.

Type-species: *Ophiarachna spinosa* LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 305. Type virtually designated by LYMAN, 1882 (Challenger Oph., p. 17) since he is the first author to definitely assign a species, by name, to the genus.

1077. O. SPINOSA (LJUNGMAN).

Ophiarachna spinosa LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 305.
Ophiopezella spinosa LYMAN, 1882. Challenger Oph., p. 17.[2] De Loriol, 1893. Rev. Suisse zool., **1**, pl. 13, f. 1*a*–1*e* (as *O. lütkeni*).

20 specimens. Philippine Islands. Torres Strait: Friday Island; Murray Islands, Mer. Society Islands.

Species of Ophiopezella not represented in the M. C. Z.

1078. O. DUBIOSA DE LORIOL, 1893. Mem. Soc. phys. hist. nat. Genève, **32**, pt. 1, no. 3, p. 7; pl. 23, f. 2–2*f*. Mauritius.

OPHIOCHASMA.

GRUBE, 1868. Jahrsb. Schles. ges. vaterl. cultur, **45**, p. 45.

Type-species: *Ophiochasma adspersa* GRUBE, 1868. *loc. cit.* = *Ophiarachna stellata* LJUNGMAN, 1867. Monotypic.

1079. O. STELLATUM (LJUNGMAN).

Ophiarachna stellata LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 305.
Ophiochasma stellata H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 121. BELL, 1884. Alert report, pl. 8, f. C (as *Ophiopinax stellatus*).

5 specimens. Gulf of Siam. Queensland: Port Denison.

OPHIARACHNELLA.

LJUNGMAN, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 640.

Type-species: *Ophiarachna gorgonia* MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 105. Type designated by H. L. CLARK, 1909.

1080. O. ANGULATA (LYMAN).

Pectinura angulata LYMAN, 1883. Bull. M. C. Z., **10**, p. 232, pl. 3, f. 7–9.
Ophiarachnella angulata H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 124.

4 specimens, including HOLOTYPE. OFF ST. CRUZ, D. W. I., 248 fms. Off Montserrat, 120 fms.

[1] See footnote, p. 237.
[2] Ljungman never used the combination "Ophiopezella spinosa," credited to him by Lyman.

1081. O. GORGONIA (MÜLLER and TROSCHEL).

Ophiarachna gorgonia MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 105.
Ophiarachnella gorgonia H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 123.

73 specimens. Zanzibar. Pelew Islands. New Guinea: Sorong. Torres Strait: Murray Islands, Mer. Queensland: Green Island, near Cairns. Fiji Islands: Viti Levu, Suva. Gilbert Islands.

1082. O. INFERNALIS (MÜLLER and TROSCHEL).

Ophiarachna infernalis MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 105.
Ophiarachnella infernalis H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 124. KOEHLER, 1905. Siboga-exp. Oph. litt., pl. 1, f. 1–3.

69 specimens. Zanzibar. Philippine Islands, 6–10 fms. Pelew Islands. New Guinea: Sorong. Torres Strait: Erub; Murray Islands, Mer.

1083. O. MACRACANTHA H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 126. Plate **18**, f. 5, 6.

HOLOTYPE and 3 PARATYPES. Caroline Islands: Ponape.

1084. O. MARMORATA (LYMAN).

Pectinura marmorata LYMAN, 1874. Bull. M. C. Z., **3**, p. 222, pl. 5, f. 1–7.

38 specimens, including HOLOTYPE and 5 PARATYPES. Zanzibar. Mauritius. Ceylon. Philippine Islands: BOHOL, 10 fms.

1085. O. MEGALASPIS H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 25, f. 2.

2 PARATYPES. EASTERN SEA, 95 fms.

1086. O. PETERSI (LYMAN).

Ophiopeza petersi LYMAN, 1878. Bull. M. C. Z., **5**, p. 217, pl. 2, f. 22–24.
Ophiarachnella petersi H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 125.

HOLOTYPE and 1 PARATYPE. Cuba: southern coast, OFF ZAPATA PENINSULA, 177 fms.

1087. O. RAMSAYI (BELL).

Pectinura ramsayi BELL, 1888. Proc. Zool. soc. London, p. 281, pl. 16, f. 1, 2.

7 specimens. New South Wales: PORT JACKSON.

1088. O. SEMICINCTA (STUDER).

Pectinura semicincta STUDER, 1882. Abh. K.-Preus. akad. wiss. Berlin, p. 4, pl. 1, f. 1–1*d*.
Ophiarachnella semicincta H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 125.

1 COTYPE. Cape Verde Islands: SETONBANK, 38 fms.

1089. O. SEPTEMSPINOSA (MÜLLER and TROSCHEL).

Ophiarachna septemspinosa MÜLLER and TROSCHEL, 1842. Syst. Ast., p. 105.
Ophiarachnella septemspinosa H. L. CLARK, 1909. Bull. M. C. Z., **52**, p. 126. DÖDERLEIN, 1889. Zool. jahrb. Syst., **3**, pl. 32, f. 4*a*–4*c*.

15 specimens, including holotype and 1 cotype of *Pectinura rigida* Lyman. Zanzibar. Mauritius. Torres Strait: Murray Islands, Mer; Weier.

Species of Ophiarachnella not represented in the M. C. Z.

1090. O. CAPENSIS (Bell), 1888. Proc. Zool. soc. London, p. 282, pl. 16, f. 3, 4 (*Pectinura*). Cape of Good Hope.

1091. O. ELEGANS (Bell), 1894. Proc. Zool. soc. London, p. 406 (*Pectinura*). East Indies: Macclesfield Bank, 13–35 fms.

1092. O. HONORATA (Koehler), 1904. Siboga-exp. Oph. mer. prof., p. 8, pl. 2, f. 1, 3 (*Pectinura*). Dutch East Indies: Kei Islands, 170 fms.

1093. O. MEGALOPLAX (Bell), 1884. Alert rept., p. 134 (*Pectinura*). Queensland: Port Molle, 14 fms.

1094. O. NITENS (Koehler), 1905. Siboga-exp. Oph. litt., p. 10, pl. 1, f. 10–12 (*Pectinura*). Dutch East Indies: off Sumbawa, 38 fms.

1095. O. PAUCISPINA (Koehler), 1905. Siboga-exp. Oph. litt., p. 4, pl. 1, f. 13–15 (*Pectinura*). Dutch East Indies: Strait of Macassar, 20 fms.; of Waigeu, 45 fms.

1096. O. SIMILIS (Koehler), 1905. Siboga-exp. Oph. litt., p. 6, pl. 1, f. 4–6 (*Pectinura*). Dutch East Indies: a dozen stations, 0–33 fms.

1097. O. SPHENISCI (Bell), 1894. Proc. Zool. soc. London, p. 406, pl. 25, f. 7–9 (*Pectinura*). Northwest Australia: Holothuria Bank.

1098. O. STABILIS (Koehler), 1905. Siboga-exp. Oph. litt., p. 5, pl. 1, f. 7–9 (*Pectinura*). Dutch East Indies: Paternoster Islands, 7 fms.; off Waigeu, 45 fms.

Bathypectinura.

H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 128.

Type-species: *Pectinura lacertosa* Lyman, 1883. Bull. M. C. Z., **10**, p. 231. Type designated.

1099. B. CONSPICUA (Koehler).

Pectinura conspicua Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 322, pl. 7, f. 36, 37. 1904. Siboga-exp. Oph. mer. prof., pl. 1.

Bathypectinura conspicua H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 130.

1 specimen. Dutch East Indies: Bali Sea, 300 fms.

1100. B. LACERTOSA (Lyman).

Pectinura lacertosa Lyman, 1883. Bull. M. C. Z., **10**, p. 231, pl. 3, f. 4–6.

Bathypectinura lacertosa H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 129.

2 specimens, including the holotype. Gulf of Mexico, 1467 fms. Off Grenada, 159 fms.

1101. B. TESSELLATA (Lyman).

Pectinura tessellata Lyman, 1883. Bull. M. C. Z., **10**, p. 230, pl. 3, f. 1–3.

Bathypectinura tessellata H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 130.

Holotype. St. Cruz, D. W. I.: off Frederickstaed, 451 fms.

Species of Bathypectinura not represented in the M. C. Z.

1102. B. ELATA (Koehler), 1906. Mem. Soc. zool. France, **19**, p. 7, pl. 1, f. 1–3 (*Pectinura*). Southwest of Canary Islands, 1292–1399 fms.

1103. B. GOTOI Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 87. Japan: Sagami Sea, 170 fms.

1104. B. HEROS (Lyman), 1879. Bull. M. C. Z., **6**, p. 48, pl. 14, f. 389–391 (*Pectinura*). Off Aru Islands, 800 fms.

1105. B. MODESTA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 7, pl. 2, f. 4–6 (*Pectinura*). Dutch East Indies: northeast of Java, 183 fms.

Cryptopelta.

H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 130.

Type-species: *Ophiopeza aster* Lyman, 1879. Bull. M. C. Z., **6**, p. 50. Type designated.

1106. C. ASTER (Lyman).

Ophiopeza aster Lyman, 1879. Bull. M. C. Z., **6**, p. 50, pl. 14, f. 395–397.
Cryptopelta aster H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 131.

1 cotype. Off the Cape of Good Hope, 150 fms.

1107. C. GRANULIFERA H. L. Clark, 1909. Bull. M. C. Z., **52**, p. 131. Plate **17**, f. 6, 7.

Holotype. Mauritius.

Ophiocryptus.

H. L. Clark, 1915. Journ. ent. zool., **7**, p. 64.

Type-species: *Ophiocryptus maculosus* H. L. Clark, 1915. *loc. cit.* Type designated.

1108. O. MACULOSUS H. L. Clark, 1915. Journ. ent. zool., **7**, p. 64. Plate **17**, f. 8, 9.

Holotype. California: Laguna Beach.

Species of Ophiocryptus not represented in the M. C. Z.

1109. O. HEXACANTHUS H. L. Clark, 1915. Journ. ent. zool., **7**, p. 64. Koehler, 1914. Bull. 84 U. S. N. M., p. 8, pl. 2, f. 1, 2 (as *Ophioderma sp.*, young). Bahamas: Green Cay.

Genus of Ophiodermatidae not represented in the M. C. Z.

Ophioncus Ives, 1889. Proc. Acad. nat. sci. Phil., p. 143.

1110. Type-species: OPHIONCUS GRANULOSUS Ives, 1889. *loc. cit.*, f. 1–5. Monotypic. Loc. ?

OPHIOLEPIDIDAE.

Ophiomastus.

Lyman, 1878. Bull. M. C. Z., **5**, p. 104.

Type-species: *Ophiomastus tegulitius* Lyman, 1878. *loc. cit.* Monotypic when established.

1111. O. PERPLEXUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 29, pl. 3, f. 10, 11.

1 cotype. Dutch East Indies: Celebes, off Gulf of Boni, 639 fms.

1112. O. SECUNDUS Lyman, 1878. Bull. M. C. Z., **5**, p. 218, pl. 2, f. 16–18.

36 specimens, including HOLOTYPE and 1 PARATYPE. Off South Carolina, 464–647 fms. Off western Cuba, 339 fms. Off St. Cruz, D. W. I., 508 fms. Off St. Kitts, 60–180 fms. Off Dominica, 333–1131 fms. Off Martinique, 334–357 fms. Off St. Vincent, 464 fms. Off Barbados, 399 fms.

1113. O. TEGULITIUS Lyman, 1878. Bull. M. C. Z., **5**, p. 104, pl. 6, f. 167–169.

1 COTYPE. Between New Guinea and the Admiralty Islands, 1070 fms.

1114. O. TUMIDUS Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 285, pl. 5, f. 7–9.

1 specimen. Dutch East Indies: Strait of Macassar, 723 fms.

Species of Ophiomastus not represented in the M. C. Z.

1115. O. LUDWIGI Koehler, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 23, pl. 3, f. 22; pl. 4, f. 27, 28. West Antarctica, 333 fms.

1116. O. TEXTURATUS Lyman, 1883. Bull. M. C. Z., **10**, p. 247, pl. 4, f. 49–51. Near Fiji Islands, 310 fms.

Ophiomisidium.

Koehler, 1914. Bull. 84 U. S. N. M., p. 32.

Type-species: *Ophiomisidium speciosum* Koehler, 1914. *op. cit.*, p. 34. Type designated.

1117. O. FLABELLUM (Lyman).

Ophiomusium flabellum Lyman, 1878. Bull. M. C. Z., **5**, p. 120, pl. 5, f. 141–143.
Ophiomisidium flabellum Koehler, 1914. Bull. 84 U. S. N. M., p. 32.

1 specimen. New South Wales: off Cape Three Points, 41–50 fms.

1118. O. PULCHELLUM (Wyville Thomson).

Ophiomusium pulchellum Wyville Thomson, 1877. The Atlantic, **2**, p. 67. Lyman, 1882. Challenger Oph., pl. 3, f. 1–3.
Ophiomisidium pulchellum Koehler, 1914. Bull. 84 U. S. N. M., p. 32.

1 specimen. Off Cape of Good Hope, 150 fms.

Species of Ophiomisidium not represented in the M. C. Z.

1119. O. SPECIOSUM Koehler, 1914. Bull. 84 U. S. N. M., p. 34, pl. 3, f. 3, 4. Brazil: off Cannavieras, 818 fms. (By an unfortunate misprint (p. 34 of Koehler's paper), the type-locality is given at 15° 39′ *N. lat.* when *S. lat.* is meant).

Anthophiura.

H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 92.

Type-species: *Anthophiura axiologa* H. L. Clark, 1911. *op. cit.*, p. 93. Monotypic.

1120. O. AXIOLOGA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 93, f. 32.

2 PARATYPES. Off Aleutian Islands, 1217 fms.

Ophiopyrgus.

Lyman, 1878. Bull. M. C. Z., **5**, p. 120.

Type-species: *Ophiopyrgus wyville thomsoni* Lyman, 1878. *op. cit.*, p. 121. Monotypic when established.

1121. O. TRISPINOSUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 30, pl. 5, f. 1–3.

1 cotype. Dutch East Indies: Celebes, off Gulf of Boni, 639 fms.

1122. O. WYVILLE THOMSONI Lyman, 1878. Bull. M. C. Z., **5**, p. 121, pl. 5, f. 135–137.

1 cotype. Tonga Islands: off Tongatabu, 240 fms.

Species of Ophiopyrgus not represented in the M. C. Z.

1123. O. ALCOCKI Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 283, pl. 5, f. 4–6. Bay of Bengal, 1310 fms.

1124. O. AUSTRALIS Koehler, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 24, pl. 7, f. 44, 45. West Antarctica, 333 fms.

1125. O. DEPRESSUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 31, pl. 4, f. 9, 10. Dutch East Indies: Strait of Macassar, 1127 fms.

1126. O. SACCHARATUS Studer, 1882. Gazelle Oph., p. 7, pl. 1, f. 4*a–e*. Fiji Islands: near Matuku, 970 fms.

Gymnophiura.

Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 111.

Type-species: *Gymnophiura mollis* Lütken and Mortensen, 1899. *loc. cit.* Type virtually designated, since it is stated that the second species described should perhaps "be referred to Ophioglypha and *G. mollis* alone remain in the genus Gymnophiura."

1127. G. MOLLIS Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 111, pl. 7, f. 8–10.

9 cotypes. Gulf of Panama, 1270 fms.

Haplophiura.

Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 76.

Type-species: *Ophiozona gymnopora* H. L. Clark, 1909. Mem. Austr. mus., **4**, p. 535. Monotypic.

1128. H. GYMNOPORA (H. L. Clark).
Ophiozona gymnopora H. L. Clark, 1909. Mem. Austr. mus., **4**, p. 535, pl. 51, f. 1–3.
Haplophiura gymnopora Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 76.

70 paratypes. New South Wales: Newcastle Bight, 26–40 fms.; off Cape Three Points, 41–50 fms.; off Port Hacking, 22–38 fms.; off Jibbon, 46–55 fms.; off Wata Mooli, 54–59 fms.

Amphiophiura.

Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

Type-species: *Ophioglypha bullata* Wyville Thomson, 1873. Nature, **8**, p. 400.

1129. A. ABCISA (Lütken and Mortensen).
Ophioglypha abcisa Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 117, pl. 2, f. 1–3.
Amphiophiura abcisa Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 78.

2 cotypes. Off Cocos Island, 134 fms.

1130. A. BULLATA (Wyville Thomson).
Ophioglypha bullata Wyville Thomson, 1873. Nature, **8**, p. 400. 1877. The Atlantic, **1**, p. 399, f. 104, 105.
Amphiophiura bullata Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

6 specimens, including 5 cotypes. Northeast from the Bermudas, 2850 fms. (One specimen was purchased from a dealer as *O. convexa* and is from an unknown locality).

1131. A. CONVEXA (Lyman).
Ophioglypha convexa Lyman, 1878. Bull. M. C. Z., **5**, p. 84, pl. 3, f. 83, 84.
Amphiophiura convexa Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

2 cotypes. Northwest from Laysan, 2050 fms.

1132. A. CORONATA (Koehler).
Ophioglypha coronata Koehler, 1914. Bull. 84 U. S. N. M., p. 12, pl. 2, f. 3, 4.

13 specimens. Off Montserrat, 148 fms. Off Martinique, 170 fms. Off St. Lucia, 116 fms. Off St. Vincent, 95–114 fms.

1133. A. CTENOPHORA (H. L. Clark).
Ophiura ctenophora H. L. Clark, 1909. Mem. Austr. mus., **4**, p. 537, pl. 51, f. 4–6.

2 paratypes. New South Wales: off Newcastle, 42–48 fms.; off Manning River, 22 fms.

1134. A. FASCICULATA (Lyman).
Ophioglypha fasciculata Lyman, 1883. Bull. M. C. Z., **10**, p. 237, pl. 3, f. 22–24.

Holotype. Off Barbados, 288 fms.

1135. A. HUMILIS (Koehler).
Ophioglypha humilis Koehler, 1904. Siboga-exp. Oph. mer prof., p. 39, pl. 7, f. 1–3.

1 cotype. Dutch East Indies: off Tanah Djambeah, 67–223 fms.

1136. A. KERMADECENSIS (Benham).
Ophiura kermadecensis Benham, 1911. Trans. N. Z. inst., **43**, p. 156, f. 18–23.

1 cotype. Kermadec Islands, 12–20 fms.

1137. A. LACAZEI (LYMAN).
Ophioglypha lacazei LYMAN, 1878. Bull. M. C. Z., **5**, p. 87, pl. 3, f. 58–60.
Amphiophiura lacazei MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

1 COTYPE. Antarctic Ocean: SOUTH OF AUSTRALIA, 2600 fms.

1138. A. LIENOSA (LYMAN).
Ophioglypha lienosa LYMAN, 1878. Bull. M. C. Z., **5**, p. 88, pl. 3, f. 80–82.

1 COTYPE. Antarctic Ocean: SOUTHWEST OF AUSTRALIA, 1950 fms.

1139. A. MEGAPOMA (H. L. CLARK).
Ophiura megapoma H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 79, f. 23.
Amphiophiura megapoma MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 78.

3 PARATYPES. SEA OF JAPAN, 114–163 fms.

1140. A. METABULA, sp. nov. (*μεταβουλος*, variable). Plate **17**, f. 1–3.

Very similar to *sculptilis* Lyman but differing in a few minor points. The arms are relatively short and stout, 2–3 times the diameter of the disk; in *sculptilis* they are 3–4 times the disk-diameter and are relatively more slender. The disk scales are fewer, much less imbricated and more pavement-like than in *sculptilis;* the central plate is seldom conspicuous. The uppermost papillae of the arm-comb tend to be blunt and flattened, and often are distinctly spatulate; in *sculptilis* they are slender and pointed. The adoral plates are very narrow and sometimes are even divided by the oral tentacle-pore, which then nearly touches the oral shield; in *sculptilis* the adoral plates are fairly wide.

HOLOTYPE (M. C. Z. 745) and 67 PARATYPES (M. C. Z. 732–744, 746, 747. 1009–1013). OFF SOUTH CAROLINA, 647 fms. OFF GRAND CAYMAN, 608 fms, NORTHWEST OF CUBA, 292–955 fms. Cuba: OFF HAVANA, 175–250 fms. OFF ST. CRUZ, D. W. I., 451–625 fms. OFF ST. KITTS, 208 fms. OFF GUADELOUPE. 175–875 fms. OFF DOMINICA, 333–824 fms. OFF MARTINIQUE, 213 fms. OFF ST. LUCIA, 423 fms. OFF ST. VINCENT, 424–875 fms. OFF THE GRENADINES, 338 fms. OFF GRENADA, 291–576 fms.

In view of the slight differences mentioned above, it seems desirable to separate the West Indian form called *variabilis* by Mr. Lyman, from the true *variabilis* (=*sculptilis*) of the East Indies. There is general agreement now that *sculptilis* and *variabilis* are identical but Verrill has queried whether the so-called *variabilis* collected by the Blake is not really distinct. I have compared the Blake specimens very carefully with the material at hand from Japan and the East Indies representing *sculptilis* and have finally decided to give them a separate name. I am increasingly inclined to do this moreover because *sculptilis* is known only from the East Indian region (southern Japan, Amboina,

Bay of Bengal) while *metabula* occurs only off the southeastern United States, among the West Indies and along the northeastern coast of South America. No allied form is known in the eastern or southern Atlantic nor in the Pacific, and the geographical gap between *sculptilis* and *metabula* is therefore enormous.

1141. A. OBTECTA (Lütken and Mortensen).

Ophioglypha obtecta Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 119, pl. 2, f. 7–9.
Amphiophiura obtecta Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 78.

1 cotype. Off the Galapagos Islands, 1360 fms.

1142. A. OEDIGNATHA, sp. nov. (οἰδιγνάθος, swollen-jawed). Plate **17**, f. 10–12.

Disk 9 mm. in diameter; arms about 18 mm. long. Very similar to *A. convexa* Lyman and *A. coronata* Koehler but readily distinguished from either by the following combination of characters. Disk covered by the central plate, 5 primary radials, 5 primary interradials and the 5 pairs of radial shields, with several small plates visible at the interradial margin; the central and 5 primary radial plates do not form any more conspicuous rosette than in *convexa* and therefore the disk is quite different from that of *coronata;* the radial shields are about equal to the primary interradial plates, instead of being much larger as in *convexa* or much smaller, as in *coronata*. The proportions and arrangement of the genital scales, first upper arm-plate, and arm-comb are as in *coronata*, and hence entirely different from those of *convexa;* but the lower arm-papillae are flat and squarish and not slender as in *coronata*. The under arm-plates, oral shields, adoral plates and oral plates are all much swollen and finely tuberculous or shagreen-like; in *coronata* this is also more or less true but the oral plates are least so and may be depressed and smooth, whereas in *oedignatha* they are relatively the most swollen (hence the name) and the least smooth. Oral papillae, much reduced especially distally where they may be quite wanting.

Holotype (M. C. Z. 752) and 3 paratypes (M. C. Z. 753, 758, 764). Off St. Kitts, 208–270 fms. Off Martinique, 472 fms.

The specimens from St. Kitts were labeled by Mr. Lyman: "*Ophioglypha convexa*. Intermediate! Only differs from *convexa* in finer arm comb papillae and in more interbrachial scales on disk margin." The specimen from Martinique is labeled: "*Ophioglypha variabilis*." The arm-comb, large genital scales, first upper arm-plate, lower arm-plates, oral shields and mouth-parts are all unlike those of *convexa* and preclude referring these specimens to that species. They approach more nearly to *coronata* but I believe the differences in the disk covering and the mouth-parts forbid reference to that species. It is therefore

necessary to give them a new name. It is possible that a large series of specimens from a single locality may prove *coronata* and *oedignatha* are simply varieties of *convexa* but such a discovery is highly improbable.

1143. A. OEDIPLAX (H. L. CLARK).
Ophiura oediplax H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 74, f. 21.
Amphiophiura oediplax MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

3 COTYPES. SEA OF JAPAN, 176–245 fms.

1144. A. OLIGOPORA (H. L. CLARK).
Ophiura oligopora H. L. CLARK, 1913. Bull. Amer. mus. nat. hist., **32**, p. 210, pl. 45, f. 8, 9.

1 PARATYPE. Lower California: OFF CAPE ST. LUCAS, 630 fms.

1145. A. ORNATA (LYMAN).
Ophioglypha ornata LYMAN, 1878. Bull. M. C. Z., **5**, p. 86, pl. 4, f. 113, 114.
Amphiophiura ornata MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 78.

1 COTYPE. NORTH OF NEW GUINEA, 2000 fms.

1146. A. PAUPERA (KOEHLER).
Ophioglypha paupera KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 290, pl. 5, f. 12, 13.
Amphiophiura paupera MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

4 specimens. Ceylon: off Colombo, 480 fms.

1147. A. PENICHRA (H. L. CLARK).
Ophiura penichra H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 84, f. 26.
Amphiophiura penichra MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 78.

7 PARATYPES. Japan: HOKKAIDO, SOUTH COAST, 175–359 fms.

1148. A. PONDEROSA (LYMAN).
Ophioglypha ponderosa LYMAN, 1878. Bull. M. C. Z., **5**, p. 93, pl. 2, f. 52–54.

18 specimens. Off Central California, 456 fms. Off Alaska, 230 fms. Off Alaskan Peninsula, 280 fms. Okhotsk Sea, 75 fms. Japan: off Omai Saki Light, 475–505 fms.

1149. A. RADIATA (LYMAN).
Ophioglypha radiata LYMAN, 1878. Bull. M. C. Z., **5**, p. 89, pl. 3, f. 65, 66.
Amphiophiura radiata MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 78.

1 COTYPE. Philippine Islands: off Luzon, 1050 fms.

1150. A. SCULPTILIS (LYMAN).
Ophioglypha sculptilis LYMAN, 1878. Bull. M. C. Z., **5**, p. 84, pl. 4, f. 115, 116.
Amphiophiura sculptilis MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

5 specimens, including 1 COTYPE and a cotype of *O. variabilis* Lyman. Arabian Sea, off the mouth of the Indus, 1506 fms. Japan: OFF YOKOHAMA, 1875 fms.; in Colnett Strait, 1008 fms. Off Amboina, 1425 fms.

1151. A. SCUTATA (LYMAN).
Ophioglypha scutata LYMAN, 1883. Bull. M. C. Z., **10**, p. 238, pl. 4, f. 28–30
Amphiophiura scutata MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

HOLOTYPE. OFF ST. VINCENT, 95 fms.

1152. A. SORDIDA (KOEHLER).
Ophioglypha sordida KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 292, pl. 5, f. 14, 15.
Amphiophiura sordida MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

2 specimens. Dutch East Indies: north of Ceram, 434 fms.

1153. A. STELLATA (STUDER).
Ophioglypha stellata STUDER, 1882. Gazelle Oph., p. 11, pl. 2, f. *5a–f.*
Amphiophiura stellata MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 77.

2 specimens. West Australia, Mermaid Strait.[1] Kei Islands, 50 fms.

1154. A. SUPERBA (LÜTKEN and MORTENSEN).
Ophioglypha superba LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 116, pl. 1, f. 4–8.

14 specimens, including 1 COTYPE, and 5 PARATYPES of *O. hadra* H. L. Clark. Mexico OFF MAZATLAN, 995 fms. Lower California: off Ballenas Bay, 930 fms. California: northwest of San Nicolas Island, 451 fms.; southwest of Santa Rosa Island, 534 fms. Off Washington, 859–877 fms. Off British Columbia, 876 fms.

Species of Amphiophiura not represented in the M. C. Z.

1155. A. ABDITA (KOEHLER), 1901. Bull. Soc. zool. France, **26**, p. 225, f. 3–5 (*Ophioglypha*). Tropical Atlantic Ocean, 3353 fms.

1156. A. ANCEPS (KOEHLER), 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 591, pl. 10, f. 92, 93 (*Ophioglypha*). Antarctic Ocean, south of Atlantic, 1410 fms.

1157. A. ASPERA (KOEHLER), 1898. Hirondelle Ech. et Oph., p. 40, pl. 6, f. 19–21 (*Ophioglypha*). Off Newfoundland, 715 fms.

1158. A. CARINIFERA (KOEHLER), 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 14, pl. 1, f. 3–5 (*Ophioglypha*). West Antarctica, 333 fms.

1159. A. DISTINCTA (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 44, pl. 9, f. 7–9 (*Ophioglypha*). Dutch East Indies: north of Sumbawa, 442 fms.; between Rotti and Timor, 120 fms.

1160. A. IMPROBA (KOEHLER), 1904. Siboga-exp. Oph. mer prof., p. 48, pl. 8, f. 4–6 (*Ophioglypha*). Dutch East Indies: near Lucipara Islands, 886 fms.

1161. A. IMPRUDENS (KOEHLER), 1906. Mem. Soc. zool. France, **19**, p. 8, pl. 1, f. 7, 8 (*Ophioglypha*). Near the Azores, 312 fms.

1162. A. INDICA (BROCK), 1888. Zeits. f. wiss. Zool., **47**, p. 477 (*Ophioglypha*). KOEHLER, 1904. Mem. Soc. zool. France, **17**, p. 61, f. 8, 9. Java: near Batavia, 15 fms.

1163. A. INOPS (KOEHLER), 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 597, pl. 11, f. 96, 97 (*Ophioglypha*). Antarctic Ocean: south of Atlantic, 1410 fms.

[1] This specimen was received in 1908 in exchange from Berlin, bearing the label: "Ophioglypha stellata Studer. Original! Mermaidstrasse, N. W. Australien. Exp.-Gazelle. Mus. Berlin." According to Studer's report, this species was taken by the Gazelle only at "Ausgang des Naturaliste Channal (West-Australien)," save for one very small specimen collected at Amboina. Mermaid Strait and Naturalist Channel are more than three hundred miles apart!

1164. A. INSOLITA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 47, pl. 7, f. 4–6 (*Ophioglypha*). Dutch East Indies: north of Batjan, 221 fms.; Kei Islands, 114 fms.

1165. A. LAPIDARIA (Lyman), 1878. Bull. M. C. Z., **5**, p. 90, pl. 3, f. 67–69 (*Ophioglypha*). Western Pacific Ocean, east from Japan, 565 fms.

1166. A. LATRO (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 41, pl. 9, f. 4–6 (*Ophioglypha*). Dutch East Indies: Kei Islands, 114 fms.

1167. A. LAUDATA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 43, pl. 8, f. 1–3 (*Ophioglypha*). Sulu Archipelago, 250 fms.

1168. A. LENTA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 53, pl. 8, f. 12, 13 (*Ophioglypha*). Dutch East Indies.

1169. A. LIBERATA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 46, pl. 7, f. 7–9 (*Ophioglypha*). Dutch East Indies: north of Ceram, 465 fms.

1170. A. LOCKINGTONI (Ives), 1889. Proc. Acad. nat. sci. Phil., p. 144, f. 6–8 (*Ophioglypha*). Loc.?

1171. A. MARTENSI (Studer), 1885. Jahrb. wiss. anst. Hamburg, **2**, p. 161, pl. 2, f. 8*a*, *b* (*Ophioglypha*). South Georgia Islands.

1172. A. POMPHOPHORA (H. L. Clark), 1911. Bull. 75 U. S. N. M., p. 89, f. 29 (*Ophiura*). Japan: off Suno Saki, 83–158 fms.

1173. A. PRISCA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 38, pl. 6, f. 9–11 (*Ophioglypha*). Dutch East Indies: near Lucipara Islands, 887 fms.

1174. A. REMOTA (Koehler) 1904. Siboga-exp. Oph. mer prof., p. 54, pl. 9, f. 1–3 (*Ophioglypha*). Dutch East Indies: Banda Sea, 1555 fms.

1175. A. RESISTENS (Koehler), 1911. Brit. Ant. exp. Rept. sci. inv., **2**, p. 42, pl. 7, f. 9–12 (*Ophioglypha*). Antarctica: Cape Royds, 10–20 fms.

1176. A. SAURURA (Verrill), 1894. Proc. U. S. N. M., **17**, p. 288 (*Ophioglypha*). Off Grand Bank, 471 fms. Off George's Bank, 677 fms.

1177. A. SCABRA (Koehler), 1905. Siboga-exp. Oph. litt., p. 20, pl. 2, f. 9, 12 (*Ophioglypha*).[1] Dutch East Indies: Kei Islands, 50 fms.

1178. A. UNDATA (Lyman), 1878. Bull. M. C. Z., **5**, p. 90, pl. 4, f. 101, 102 (*Ophioglypha*). Near Fiji Islands, 1450 fms.

1179. A. URBANA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 50, pl. 7, f. 10–12 (*Ophioglypha*). Dutch East Indies: near Waigeu, 261 fms.

Stegophiura.

Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 78.

Type-species: *Ophiura nodosa* Lütken, 1855. Vid. med. f. 1854, p. 100. Type designated.

1180. S. BRACHYACTIS (H. L. Clark).

Ophiura brachyactis H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 87, f. 28.
Stegophiura brachyactis Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 79.

1 paratype. Saghalin: off Cape Tonin, 64 fms.

1181. S. MACRARTHRA, sp. nov. (μακρός, long + ἄρθρον, joint). Plate **19**, f. 7, 8.

Disk 6.5 mm. in diameter; arms about 18 mm. long. Very similar to *S. stuwitzii* (Lütken) but differing in the character of the arms and arm-spines.

[1] Owing to an unfortunate error, figures 10 and 12 on pl. **2** of Siboga littoral ophiurans have exchanged their numbers; hence all text references are wrong. The same is true of figures 5 and 7 of the same plate.

The arms are nearly three times the disk diameter (instead of about twice as in *stuwitzii*) and are very slender distally, the joints becoming cylindrical, more than twice as long as thick (hence the name) and quite smooth. The arm-spines are 4 or 5 at the base of the arm, slender, bluntly pointed and well-spaced; they are quite different from the minute flattened tentacle-scales; in *stuwitzii*, the arm-spines are often 6 in number, and are flattened and rather crowded, and the tentacle-scales are large and resemble the lower arm-spines. The median ridge on the lower arm-plates is confined to 5 or 6 basal joints in *macrarthra*. Color (dried from alcohol), white.

HOLOTYPE (M. C. Z. 757). OFF GEORGIA, 233 fms. Blake St. cccxxi; lat. 32° 43′ 25″ N., long. 77° 20′ 30″ W.

This specimen is labeled by Mr. Lyman: "Ophioglypha stuwitzii? *var.* Arm spines slenderer and more spaced than in smaller specimens of true stuwitzii, and back scales thinner. About as in 2 vars. of O. sarsii." Mr. Lyman does not seem to have noticed the difference in the terminal half of the arm which clearly separates this species from *stuwitzii*. It seems to me from Koehler's description and figure (1914. Bull. 84 U. S. N. M., p. 16, pl. 3, f. 5) that the ophiuran from Albatross St. 2675 which he referred to Lyman's *Ophioglypha elevata* is a specimen of *macrarthra*. I do not think these western Atlantic specimens should be referred to the Challenger species from Prince Edward Islands, southern Indian Ocean, since the disk-scaling, arm-form, upper and under arm-plates, and tentacle-scales are all different. In *elevata* so far as can be judged from Lyman's figures, the arms are not at all compressed, with a faint keel basally, as they are in *macrarthra* and *stuwitzii*, and the basal arm-plates are very much larger and relatively wider.

1182. S. NODOSA (LÜTKEN).

Ophiura nodosa LÜTKEN, 1855. Vid. med. f. 1854, p. 100. 1858. Add. ad hist. Oph., pt. 1, p. 48, pl. 2, f. 9*a–b*.
Stegophiura nodosa MATSUMOTO, 1915. Proc. Acad nat. sci. Phil., **67**, p. 79.

175 specimens. Karahavet. Spitzbergen[1]: off Hackluyts Head, 20 fms. GREENLAND. Labrador: off Caribou, 10–12 fms.; Egg Harbor, 7 fms. Strait of Belle Isle. Alaska: Icy Cape; off Cape Sabine. Bering Sea, 17–20 fms. Bering Strait: 12 miles east of Kings Island, 17 fms. Aleutian Islands: Unga, Coal Station, 8–9 fms. Okhotsk Sea, 25 fms. Saghalin: Aniwa Bay, 42–43 fms.

1183. S. SCULPTA (DUNCAN).

Ophioglypha sculpta DUNCAN, 1879. Journ. Linn. soc. Zool., **14**, p. 455, pl. 9, f. 6–8, pl. 11, f. 35.
Stegophiura sculpta MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 79.

[1] Without definite locality.

5 specimens. Japan: southwest of Goto Islands, 95–106 fms. Dutch East Indies: off east end of Sumbawa, 41 fms.

1184. S. SLADENI (DUNCAN).

Ophioglypha sladeni DUNCAN, 1879. Journ. Linn. soc. Zool., **14**, p. 458. H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 83, f. 25 (as *Ophiura stiphra*).

Stegophiura sladeni MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 79.

6 specimens, paratypes of *Ophiura stiphra*. Japan: off east coast, 45–70 fms.; off Kagoshima Gulf, 152 fms.

1185. S. STEREA (H. L. CLARK).

Ophioglypha sterea H. L. CLARK, 1908. Bull. M. C. Z., **51**, p. 293. 1911. Bull. 75 U. S. N. M., p. 76, f. 22.

Stegophiura sterea MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 79.

29 specimens, including HOLOTYPE and 3 COTYPES. Japan: URAGA CHANNEL, 70–150 fms.; off Ando Saki, 79 fms.; off Kinkwasan Light, 81 fms.; off east coast, 82 fms.

1186. S. STUWITZII (LÜTKEN).

Ophiura stuwitzii LÜTKEN, 1857. Vid. med., p. 51. 1858. Add. ad hist. Oph., pt. 1, p. 49, pl. 1, f. 8*a–d*.

Stegophiura stuwitzii MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 79.

12 specimens. Greenland: Davis Strait, 20 fms. Alaska.

1187. S. VIVIPARA MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 79.

1 COTYPE. Japan: SAGAMI SEA, 85 fms.

Species of Stegophiura not represented in the M. C. Z.

1188. S. ELEVATA (LYMAN), 1878. Bull. M. C. Z., **5**, p. 82, pl. 4, f. 87–89 (*Ophioglypha*). Southeast from Cape of Good Hope: Prince Edward Islands, 310 fms.

1189. S. SOLIDA (LYMAN), 1878. Bull. M. C. Z., **5**, p. 91, pl. 5, f. 120–122 (*Ophioglypha*). Dutch East Indies: Kei Islands, 129 fms.

1190. S. STRIATA (DUNCAN), 1879. Journ. Linn. soc. Zool., **14**, p. 452, pl. 9, f. 4–5*a* (*Ophioglypha*). Korean Seas: Sondai Bay.

OPHIUROLEPIS.

MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 80.

Type-species: *Ophiolepis carinata* STUDER, 1876. Monatsb. K.-Preus. akad. wiss. Berlin, p. 460. Monotypic.

1191. O. CARINATA (STUDER).

Ophiolepis carinata STUDER, 1876. Monatsb. K.-Preus. akad. wiss. Berlin, p. 460. 1882. Gazelle Oph., p. 15, pl. 2, f. 7*a–f* (as *Ophioglypha carinata*).

Ophiurolepis carinata MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 80.

8 specimens, including 3 COTYPES, and 5 cotypes of *Ophioglypha deshayesi* Lyman. KERGUELEN ISLAND. Off Heard Island, 75 fms.

Ophiura.

Lamarck, 1816. Anim. sans Vert., **2**, p. 540.

Type-species: *Ophiura texturata* Lamarck, 1816. *op. cit.*, p. 542 = *Asterias ophiura* Linné, 1758 Syst. nat. ed., 10, p. 662. Type by tautonomy.

1192. O. ACERVATA (Lyman).

Ophioglypha acervata Lyman, 1869. Bull. M. C. Z., **1**, p. 316. Koehler, 1907. Bull. sci., **41**, pl. 10, f. 5, 6.
Ophiura acervata Meissner, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

323 specimens, including HOLOTYPE and 64 PARATYPES. Off Georgia, 225–229 fms. Florida: off west coast, 42–100 fms.; off Boca Grande, 105–135 fms., OFF CARYSFORT REEF, 35–117 fms.; West Channel, 4 fms.; OFF PACIFIC REEF, 30 fms.; OFF SAND KEY, 67–128 fms.; SOUTHWEST OF SAND KEY, 125 FMS.; off Tennessee Reef, 174 fms.; OFF ALLIGATOR REEF, 79–88 fms.; off Sombrero Key, 47 fms.; OFF CONCH REEF, 77–117 fms.; OFF KEY WEST, 120 fms. Cuba: off Havana, 119–240 fms. Off Yucatan, 84 fms. Off St. Cruz, D. W. I., 115 fms. Off Saba Bank, 150 fms. Off St. Kitts, 60–180 fms. Off Dominica, 118 fms. Off Grenada, 92–159 fms. Off Barbados, 100 fms.

1193. O. AEQUALIS (Lyman).

Ophioglypha aequalis Lyman, 1878. Bull. M. C. Z., **5**, p. 72, pl. 3, f. 74, 75.
Ophiura aequalis Meissner, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

3 specimens, including 1 COTYPE. Ceylon: off Colombo, 480 fms. Dutch East Indies: Aru Islands, west of Dobo, 989 fms. BETWEEN NEW GUINEA AND THE ADMIRALTY ISLANDS, 1070 fms.

1194. O. AFFINIS Lütken, 1858. Add. ad hist. Oph., pt. 1, p. 45, pl. 2, f. 10*a–b*.

22 specimens. North Sea, 36 fms. Norway. Öresund. Ireland: west coast, Cleggan Bay.

1195. O. ALBIDA Forbes, 1839. Mem. Wern. soc., **8**, p. 125. Lütken, 1858. Add. ad hist. Oph., pt. 1, p. 39, pl. 1, f. 2*a–b*.

55 specimens. Norway: Finmark, 60 fms. Öresund. Sweden: Bohuslän; Bohusia. Faroe Islands. Scotland: Oban. Wales: Milford. Azores: San Miguel, 150–250 fms. Naples. Adriatic Sea.

1196. O. AMBIGUA (Lyman).

Ophioglypha ambigua Lyman, 1878. Bull. M. C. Z., **5**, p. 79, pl. 2, f. 47, 48.
Ophiura ambigua Meissner, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

6 COTYPES. KERGUELEN: off Christmas Harbor, 120 fms.

1197. O. AURANTIACA Verrill.

Ophioglypha aurantiaca Verrill, 1882. Amer. journ. sci., ser. 3, **23**, p. 141. Lyman, 1883. Bull. M. C. Z., **10**, p. 240, pl. 4, f. 34–36.
Ophiura aurantiaca Bell, 1892. Cat. Brit. Ech. Brit. mus., p. 112.

3 specimens. Faroe Channel?, 530 fms. Off Newport, R. I. South of Nantucket, 466 fms.

1198. O. BATHYBIA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 58, f. 14.

34 paratypes. Bering Sea, 1766–1771 fms. Alaska: South of Shumagin Islands, 1973 fms.

1199. O. BREVISPINOSA, nom. nov.

Ophioglypha brevispina E. A. Smith, 1876. Ann. mag. nat. hist., ser. 4, **17**, p. 112. Lyman, 1878. Bull. M. C. Z., **5**, p. 78, pl. 2, f. 44–46.
Ophiura brevispina Meissner, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925, non *Ophiura brevispina* Say, 1825.

7 specimens. Kerguelen Island[1]: Royal Sound.

1200. O. CALYPTOLEPIS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 67, f. 18.

8 paratypes. Japan: Uraga Strait, 197 fms.

1201. O. CAPENSIS (Bell).

Ophiozona capensis Bell, 1905. Mar. inv. S. Africa, **3**, p. 256, pl. 1, f. 1, 2.
Ophiura capensis Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 81.

2 cotypes. Cape Colony: 29 miles southwest of Cape St. Francis, 75 fms.

1202. O. CARNEA Lütken, 1858. Add. ad hist. Oph., pt. 1, p. 41, pl. 1, f. 6*a*, *b*.

15 specimens. Norway[1]: Lofoden, 200–300 fms. Ireland: off west coast, 220 fms.

1203. O. CLEMENS (Koehler).

Ophioglypha clemens Koehler, 1904. Siboga-exp. Oph. mer prof., p. 51, pl. 8, f. 7–9.
Ophiura clemens Matsumoto, 1915. Proc. Acad. nat. sci., Phil., **67**, p. 81.

1 cotype. Dutch East Indies: North of Sumbawa, 386 fms.

1204. O. COSTATA (Lyman).

Ophioglypha costata Lyman, 1878. Bull. M. C. Z., **5**, p. 76, pl. 4, f. 92–94.
Ophiura costata Meissner, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

2 cotypes. Off Cape of Good Hope, 150 fms.

1205. O. CRYPTOLEPIS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 69, f. 19.

8 paratypes. Off Alaskan Peninsula, 280–625 fms.

[1] Without definite locality.

1206. O. FALCIFERA (LYMAN).

Ophioglypha falcifera LYMAN, 1869. Bull. M. C. Z., **1**, p. 319. 1871. Illus. cat. M. C. Z., no. 6, pl. 1, f. 3–5. 1883. Bull. M. C. Z., **10**, pl. 4, f. 37–39.
Ophiura falcifera MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

92 specimens, including HOLOTYPE and 1 PARATYPE. Florida: REBECCA CHANNEL, 377 fms. Gulf of Mexico, 539 fms. Off western Cuba, 339 fms. Off St. Cruz, D. W. I., 451–508 fms. Off Dominica, 333–372 fms. Off Martinique, 357–502½ fms. Off St. Lucia, 422–423 fms. Off St. Vincent, 424–464 fms. Off Grenada, 576 fms.

1207. O. FLAGELLATA (LYMAN).

Ophioglypha flagellata LYMAN, 1878. Bull. M. C. Z., **5**, p. 69, pl. 2, f. 49–51.
Ophiura flagellata MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

20 specimens, including a cotype of *Gymnophiura caerulescens* Lütken and Mortensen. Gulf of California, 995 fms. Off Aleutian Islands, 850 fms. Japan: Sagami Sea, 369–405 fms.; Uraga Strait, 88 fms. Dutch East Indies: north of Sumbawa, 386 fms. Off Andaman Islands, 419 fms.

1208. O. FRATERNA (LYMAN). Plate **19**, f. 3, 4.

Ophioglypha fraterna LYMAN, 1878. Bull. M. C. Z., **5**, p. 81, pl. 4, f. 112.
Ophiura fraterna MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

1 COTYPE. East of Heard Island, 1950 fms.

1209. O. HEXACTIS (E. A. SMITH). Plate **19**, f. 5, 6.

Ophioglypha hexactis E. A. SMITH, 1876. Ann. mag. nat. hist., ser. 4, **17**, p. 111.
Ophiura hexactis MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

18 specimens. KERGUELEN ISLAND, 9 fms: Royal Sound, 25 fms.

1210. O. IMBECILLIS (LYMAN).

Ophioglypha imbecillis LYMAN, 1878. Bull. M. C. Z., **5**, p. 73, pl. 3, f. 63, 64.
Ophiura imbecillis MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

6 specimens, including 1 COTYPE. Japan: OFF EAST COAST, 345 fms.; Sagami Sea, 369–405 fms. Dutch East Indies: Strait of Macassar, 723 fms.

1211. O. INERMIS (LYMAN).

Ophioglypha inermis LYMAN, 1878. Bull. M. C. Z., **5**, p. 95, pl. 5, f. 123–125.
Ophiura inermis MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

1 COTYPE. OFF TRISTAN D'ACUNHA, 500 fms.

1212. O. IRRORATA (LYMAN).

Ophioglypha irrorata LYMAN, 1878. Bull. M. C. Z., **5**, p. 73, pl. 4, f. 106–108.
Ophiura irrorata MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

28 specimens, including 1 cotype of *Ophioglypha grandis* Verrill, 2 cotypes of *Ophioglypha orbiculata* Lyman and 6 cotypes of *Ophioglypha tumulosa* Lütken

and Mortensen. Off Portugal, 470–1125 fms. South of Nova Scotia, 1742 fms. Off Virgin Gorda, 1097 fms. Lower California: southwest from Magdalena Bay, 1760 fms. Gulf of Panama, 1270 fms.; off Malpelo Island, 1772 fms. Off Ecuador, 1740 fms. East of Galapagos Islands, 1322 fms. East from Japan, 1875 fms. Japan: off Omai Saki Light, 918 fms. Okhotsk Sea, 1800 fms. Off New Zealand, 275 fms., (very young; identification dubious). Off New South Wales, 400 fms. (young; identification dubious).

1213. O. KINBERGI Ljungman, 1866. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 166. Lyman, 1882. Challenger Oph., pl. 4, f. 7 (as *Ophioglypha ferruginea*). H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 37, f. 9.

39 specimens, including 1 cotype, the holotype and 5 paratypes of *Ophioglypha sinensis* Lyman, and 2 cotypes of *Ophioglypha ferruginea* Lyman. Japan: off east coast, 13–26 fms.; Bay of Yeddo. Hong Kong. Calcutta. Philippine Islands, 30 fms. New Guinea; off McClure Gulf, 51 fms. Torres Strait: Murray Islands, Mer, 18 fms. New South Wales: Port Jackson; Sydney, 12–20 fms. Victoria: off Port Philip.

1214. O. LEPIDA (Lyman).

Ophioglypha lepida Lyman, 1878. Bull. M. C. Z., **5**, p. 70, pl. 3, f. 71–73.
Ophiura lepida Meissner, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

50 specimens, including 1 cotype. Off Portugal, 1127 fms. South of Nova Scotia, 1350 fms. Off Nantucket, 1242 fms. South of Marthas Vineyard. Off New Jersey, 1241–1394 fms. Off Delaware, 1186 fms. Off Georgia, 333–1047 fms. Gulf of Mexico, 804 fms. Yucatan; off Chincorro Bank, 600 fms.

1215. O. LEPTOCTENIA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 51, f. 12.

224 specimens, including 220 paratypes. Bering Sea, 74 fms. Okhotsk Sea, 73 fms. Japan: Hokkaido, off south coast, 175–349 fms.; off southwest coast, 390–406 fms. Sea of Japan, 245 fms. Off Alaskan Peninsula, 695 fms. Off British Columbia, 876 fms. Off Washington, 67–760 fms. California: southwest from Monterey Bay, 659 fms.; southwest of Santa Rosa Island, 534 fms.

1216. O. LJUNGMANI (Lyman).

Ophioglypha ljungmani Lyman, 1878. Bull. M. C. Z., **5**, p. 71, pl. 3, f. 77. Koehler, 1909. Princesse-Alice Echinod., pl. 6, f. 6, colored (as *O. thouleti*).
Ophiura ljungmani Meissner, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

4 cotypes. Off Eastern Brazil, 350 fms.

1217. O. LOVENI (LYMAN).

Ophioglypha loveni LYMAN, 1878. Bull. M. C. Z., **5**, p. 80, pl. 4, f. 109–111.
Ophiura loveni MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

4 COTYPES. Antarctic Ocean: BETWEEN PRINCE EDWARD AND MARION ISLANDS, 1375 fms.; SOUTHWEST FROM AUSTRALIA, 1950 fms.

1218. O. LÜTKENII (LYMAN).

Ophioglypha lütkenii LYMAN, 1860. Proc. Boston soc. nat. hist., **7**, p. 197.
Ophiura lütkeni MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925. MCCLENDON, 1909. Univ. Cal. publ. Zool., **6**, pl. 6, f. 32, 33.

138 specimens. PUGET SOUND, Friday Harbor. Off Oregon, 68 fms. Off Central California, 47–62 fms. California: Santa Barbara; 5 miles south of Santa Barbara, 22 fms.; off San Diego, 30 fms.

1219. O. LYMANI (LJUNGMAN).

Ophioglypha lymani LJUNGMAN, 1870. Öfv. Kongl. Vet.-akad. Förh., **27**, p. 472. KOEHLER, 1907. Bull. sci., **41**, pl. 10, f. 11, 12.
Ophiura lymani MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

53 specimens. Off southern Chile, 147 fms. Patagonia[1]: off southeast coast; off Port Gallegos, 55 fms.

1220. O. MACULATA (LUDWIG).

Ophioglypha maculata LUDWIG, 1886. Zool. jahrb. Syst., **1**, p. 283.
Ophiura maculata H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 49, f. 11.

23 specimens. Alaska: 10 miles west of Port Franklin, 13½ fms. Aleutian Islands: Kyska Harbor, 10 fms. East Siberia: PLOVER BAY, 10–25 fms.

1221. O. MICRACANTHA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 47, f. 10.

2 PARATYPES. Japan: URAGA STRAIT, 197 fms.; OFF KAGOSHIMA GULF, 152 fms.

1222. O. MONOSTOECHA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 65, f. 17.

2 PARATYPES. Japan: OFF EAST COAST, 153 fms.; BUNGO CHANNEL, 437 fms.

1223. O. MULTISPINA (LJUNGMAN). Plate **19**, f. 1, 2.

Ophioglypha multispina LJUNGMAN, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 307.
Ophiura multispina MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

5 specimens. New South Wales: Port Jackson (SYDNEY), 4–6 fms.

1224. O. OÖPLAX (H. L. CLARK).

Ophiocten oöplax H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 99, f. 37.
Ophiura oöplax MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 81.

20 specimens, including 13 PARATYPES. Japan: Hitode, 400 fms.; OFF SHIO

[1] Without definite locality. These specimens (3) are labeled: "Salmin coll. Probably of those described by Ljungman."

MISAKI LIGHT, 440 fms.; SAGAMI SEA, 292 fms.; SOUTHWEST OF KOSHIKA ISLANDS, 427 fms. EASTERN SEA, 391–406 fms.

1225. O. OPHIURA (LINNÉ).

Asterias ophiura Linné, 1758. Syst. nat. ed. 10, p. 662. LÜTKEN, 1858. Add. ad hist. Oph., pt. 1, pl. 1, f. 1*a–e* (as *Ophiura texturata*).

69 specimens. Sweden: Bohusia, 10 fms. Öresund. British Seas. Wales: Conway Bay. Heligoland. France: "Cape Breton" (Bretagne?), 28 fms. Mediterranean Sea. Italy: Civita Vecchia. Naples. Leghorn. Adriatic Sea. Trieste. Coast of Algiers.

1226. O. PLANA (LÜTKEN and MORTENSEN).

Ophioglypha plana LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 122, pl. 3, f. 1–4.
Ophiura plana MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

17 COTYPES. GULF OF PANAMA, 1132–1672 fms.

1227. O. QUADRISPINA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 55, f. 13.

22 PARATYPES. Bering Sea, 350 fms. Off Bering Island, 64 fms. Off Alaskan Peninula, 60 fms. Off Copper Island, 56 fms. Aleutian Islands: off Agattu Island, 482 fms. Okhotsk Sea, 109 fms. Sea of Japan, 325 fms.

1228. O. ROBUSTA (AYRES).

Ophiolepis robusta AYRES, 1851. Proc. Boston soc. nat. hist., **4**, p. 134.
Ophiura robusta BELL, 1892. Cat. Brit. Ech. Brit. mus., p. 109.

149 specimens. Norway.[1] Öresund. Spitzbergen[1], 20 fms.; off Shoal Point and Treurenberg Bay, 15–37 fms.; Storfjord, 23½ fms. Off Nova Zembla, 95 fms. Greenland. Strait of Belle Isle. Anticosti. Nova Scotia: Chedabucto Bay. New Brunswick: Grand Manan, off Duck Island, 18–20 fms. Maine: Eastport; Casco Bay. MASSACHUSETTS BAY. Massachusetts: Phillips Beach; Chatham, off Crab Ledge, 17 fms.

1229. O. RUGOSA (LYMAN).

Ophioglypha rugosa LYMAN, 1878. Bull. M. C. Z., **5**, p. 92, pl. 4, f. 90, 91.
Ophiura rugosa MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

1 COTYPE. OFF NEW ZEALAND, 700 fms.

1230. O. SARSII LÜTKEN, 1855. Vid. med. f. 1854, p. 101. 1858. Add. ad hist. Oph., pt. 1, pl. 1, f. 3*a–d*. KOEHLER, 1909. Princesse-Alice Echinod., pl. 7, f. 3, colored (as *Ophioglypha sarsi*).

1065 specimens. Off Spitzbergen, 250 fms. Greenland. Norway[1]: Lofoden, 200–300 fms.; Trondhjeim Fjord. South of Nova Scotia, 306 fms. South of Halifax, 100 fms. Off Halifax. New Brunswick: Grand Manan, off White Horse Island, 12 fms.; off Duck Island, 20 fms. Maine: Eastport; Isle au

[1] Without definite locality.

Haut; Casco Bay. Massachusetts Bay. Off Marthas Vineyard, 44–182 fms. Off Nantucket, 46–239 fms. Off Newport, 192 fms. Off Cape Hatteras, 263 fms. Arctic Ocean: north of Cape Prince of Wales. Bering Sea, 36–70 fms. Off Bering Island, 72–76 fms. Alaska. Off Alaskan Peninsula, 42 fms. Washington: Puget Sound[1]: Sucre Island. Off Washington, 77–123 fms. Okhotsk Sea, 75 fms. Gulf of Tartary, 318 fms. Sea of Japan, 44–335 fms. Japan: off Hokkaido, 68–92 fms.; Hakodate Bay, 15½–22 fms.

1231. O. SIGNATA (VERRILL).

Ophioglypha signata VERRILL, 1882. Amer. jour. sci., ser. 3, **23**, p. 220. HOYLE, 1884. Proc. Roy. soc. Edinburgh, **12**, pl. 7, f. 4–8.
Ophiura signata BELL, 1892. Cat. Brit. Ech. Brit. mus., p. 110.

44 specimens. Faroe Channel, 540 fms. Off southwestern Ireland, 424 fms. OFF MARTHAS VINEYARD, 63–129 fms. OFF NEWPORT, 100–142½ fms.

1232. O. TENERA (LYMAN).

Ophioglypha tenera LYMAN, 1883. Bull. M. C. Z., **10**, p. 239, pl. 4, f. 31–33.
Ophiura tenera MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

3 specimens, including HOLOTYPE and 1 PARATYPE. Off St. Vincent, 88–124 fms.

1233. O. TRIMENI (BELL).

Ophioglypha trimeni BELL, 1905. Mar. inv. S. Africa, **3**, p. 257, pl. 1, f. 3, 4.

2 specimens. Cape of Good Hope.

1234. O. VERRUCOSA (STUDER).

Pectinura verrucosa STUDER, 1876. Monatsb. K.-Preus. akad. wiss. Berlin, p. 461. 1882. Gazelle Oph., p. 14, pl. 2, f. 6*a–d* (as *Ophioglypha verrucosa*).
Ophiura verrucosa MEISSNER, 1901. Bronn's Thierreichs, **2**, abt. 3, p. 925.

1 COTYPE. NORTH OF KERGUELEN ISLAND, 115 fms.

Species of Ophiura not represented in the M. C. Z.

1235. O. ALBATA (LYMAN), 1878. Bull. M. C. Z., **5**, p. 77, pl. 4, f. 95–97 (*Ophioglypha*). Off eastern Japan, 775 fms.

1236. O. AMPHITRITES (BELL), 1888. Proc. Zool. soc. London, p. 283, pl. 16, f. 6 (*Ophioglypha*). Ecuador.

1237. O. ATACTA H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 85, f. 27. Off Aleutian Islands, 625 fms.

1238. O. CALEDONICA (KOEHLER), 1907. Bull. sci., **41**, p. 291, pl. 10, f. 7, 8 (*Ophioglypha*). New Caledonia.

1239. O. CONCRETA (KOEHLER), 1901. Bull. Soc. zool. France, **26**, p. 228. 1909. Princesse-Alice Echinod., pl. 25, f. 3–5 (*Ophioglypha*). Near Cape Verde Islands, 1377 fms.

[1] Without definite locality.

1240. O. DÖDERLEINI (Koehler), 1900. Bull. Acad. Belgique, p. 819. Belgica Ech. et Oph., p. 19, pl. 5, f. 34–36 (*Ophioglypha*). West Antarctica, 264–278 fms.

1241. O. FIGURATA (Koehler), 1907. Zool. anz., **32**, p. 145. 1908. Trans. Roy. Soc. Edinburgh, **46**, p. 587, pl. 9, f. 83, 84 (*Ophioglypha*). Near South Orkney Islands, 1775 fms.

1242. O. INNOXIA (Koehler), 1906. Exp. Ant. Franc. Ech., p. 27, pl. 1, f. 7, 8 (*Ophioglypha*). Antarctic Ocean.

1243. O. INTEGRA (Koehler), 1907. Zool. anz., **32**, p. 145. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 584, pl. 8, f. 79, 80 (*Ophioglypha*). Near South Orkney Islands, 1775 fms.

1244. O. JEJUNA (Lyman), 1878. Bull. M. C. Z., **5**, p. 78, pl. 2, f. 55, 56 (*Ophioglypha*). Off Tristan d'Acunha, 500 fms.

1245. O. KOEHLERI Bell, 1908. Nat. Ant. exp. nat. hist., **4**, Ech., p. 11. East Antarctica, 245 fms.

1246. O. KOFOIDI McClendon, 1909. Univ. Cal. Publ. zool., **6**, p. 38, pl. 2, f. 8, 9. California: off La Jolla, 80 fms.

1247. O. LENTICULARIS (Koehler), 1907. Zool. anz., **32**, p. 145. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 585, pl. 10, f. 90, 91 (*Ophioglypha*). Antarctic Ocean, 2103 fms.

1248. O. MERIDIONALIS (Lyman), 1879. Bull. M. C. Z., **6**, p. 56, pl. 16, f. 447–449 (*Ophioglypha*). Off Rio de la Plata, 600 fms.

1249. O. OSSICULATA (Koehler), 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 588, pl. 9, f. 85–87 (*Ophioglypha*). Antarctic Ocean, 1410 fms.

1250. O. PALLIATA (Lyman), 1878. Bull. M. C. Z., **5**, p. 69, pl. 4, f. 98–100 (*Ophioglypha*). Off New South Wales, 400–1200 fms.

1251. O. PODICA (Koehler), 1910. Rec. Indian mus., **5**, p. 83, pl. 5, f. 1, 2 (*Ophioglypha*). Arabian Peninsula: off Oman, 492 fms.

Homalophiura [1] gen. nov.

Type-species: *Ophioglypha inornata* Lyman, 1878. Bull. M. C. Z., **5**, p. 97.

Disk flat or slightly elevated, covered with scales, of which at least a few (often the six primaries) tend to be circular; the larger scales are not surrounded by belts of smaller ones, though they are mingled with them. Arm-comb reduced to series or a group of granules on the upper end of the genital plate and on the basal arm-joint; it is often feebly developed and may be wanting. Tentacle-pores small and confined to two or three basal arm-joints. Second oral tentacles opening entirely outside of mouth slit, guarded by several scales on each side. Arm-spines few and minute.

This is a well-characterized and homogeneous group, resembling Ophiomusium in the reduction of the tentacle-pores and their restriction to the basal arm-joints but easily distinguished from that genus by the second pair of oral tentacles which are entirely outside the mouth slit, and guarded by a number of tentacle-scales as in Ophiura. It is probable that when a critical revision of the latter genus is made a number of additional species will be placed in the present group.

[1] ὁμαλός, level, flat + ὀφιύρα.

1252. H. ABYSSORUM (LYMAN).
Ophioglypha abyssorum LYMAN, 1883. Bull. M. C. Z., **10**, p. 238, pl. 3, f. 25–27.

3 specimens, including HOLOTYPE and 1 PARATYPE. South of Marthas Vineyard, 466 fms. Off Virgin Gorda, 1097 fms.

1253. H. CLASTA (H. L. CLARK).
Ophiura clasta H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 64, f. 16.

6 PARATYPES. Japan: OFF OMAI SAKI LIGHT, 624–918 fms.

1254. H. CONFRAGOSA (LYMAN).
Ophioglypha confragosa LYMAN, 1878. Bull. M. C. Z., **5**, p. 97, pl. 2, f. 38, 39, 57.

5 COTYPES. OFF RIO DE LA PLATA, 600 fms.

1255. H. DIVISA (LÜTKEN and MORTENSEN).
Ophioglypha divisa LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 127, pl. 4, f. 10–12; pl. 5, f. 1, 2.

2 COTYPES. NEAR GALAPAGOS ISLANDS, 1360 fms.

1256. H. INERMIS (BELL). Plate **20**, f. 3, 4.
Ophiozona inermis BELL, 1902. Nat. hist. Southern Cross, p. 217.

5 COTYPES. Antarctica: South Victoria Land, OFF CAPE ADARE, 26 fms.

1257. H. INORNATA (LYMAN).
Ophioglypha inornata LYMAN, 1878. Bull. M. C. Z., **5**, p. 97, pl. 2, f. 26, 27.

2 specimens, including 1 COTYPE. TROPICAL ATLANTIC, 1850 fms. Dutch East Indies: north of Sumbawa, 386 fms.

1258. H. INTORTA (LYMAN).
Ophioglypha intorta LYMAN, 1878. Bull. M. C. Z., **5**, p. 98, pl. 2, f. 41–43.

14 COTYPES. OFF MARION ISLAND, 50–75 fms.

Species of Homalophiura not represented in the M. C. Z.[1]

1259. H. BRUCEI (KOEHLER), 1907. Zool. anz., **32**, p. 145, 1908. Trans. Roy. soc. Edinburgh, **46**, p. 582, pl. 8, f. 81, 82 (*Ophioglypha*). Antarctic Ocean, 2425–2620 fms.

1260. H. FLEXIBILIS (KOEHLER), 1911. Brit. Ant. exp. Rept. sci. Invert., **2**, p. 44, pl. 5, f. 1, 2 (*Ophioglypha*). Antarctica: off Cape Royds, 60–80 fms.

1261. H. FRIGIDA (KOEHLER), 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 16, pl. 5, f. 31–33 (*Ophioglypha*). West Antarctica, 166–333 fms.

1262. H. GELIDA (KOEHLER), 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 17, pl. 1, f. 6–8 (*Ophioglypha*). West Antarctica, 55–333 fms.

1263. H. INFLATA (KOEHLER), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 288, pl. 5, f. 10, 11 (*Ophioglypha*). Ceylon: off Colombo, 597 fms.

1264. H. MIMARIA (KOEHLER), 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 590, pl. 9, f. 88, 89 (*Ophioglypha*). Antarctic Ocean, 1410 fms.

[1] As I have seen none of these species, they are referred to this genus with some hesitation.

1265. H. NANA (Lütken and Mortensen), 1899. Mem. M. C. Z., **23**, p. 126, pl. 2, f. 10–12 (*Ophioglypha*). Off Cocos Island, 902 fms.

1266. H. PARTITA Koehler, 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 595, pl. 10, f. 94, 95 (*Ophioglypha*). Antarctic Ocean, 1775 fms.

1267. H. ROUCHI (Koehler), 1912. Charcot-exp. Ech., p. 107, pl. 9, f. 11, 12 (*Ophioglypha*). Antarctica: Roosen Canal, 40–72 fms.

1268. H. SCISSA (Koehler), 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 594, pl. 11, f. 98, 99 (*Ophioglypha*). Antarctic Ocean, 1410 fms.

1269. H. SCUTELLATA (Lütken and Mortensen), 1899. Mem. M. C. Z., **23**, p. 125, pl. 2, f. 4–6 (*Ophioglypha*). Mexico: off Las Tres Marias Islands, 680 fms.

1270. H. TESSELLATA (Verrill), 1894. Proc. U. S. N. M., **17**, p. 290 (*Ophioglypha*). Koehler, 1909. Princesse-Alice Echinod., pl. 25, f. 12, 13; pl. 27, f. 5, 6. Off east coast of United States, 250–2033 fms.

Ophionotus.

Bell, 1902. Nat. hist. Southern Cross, p. 218.

Type-species: *Ophionotus victoriae* Bell, 1902. *op. cit.*, p. 219. Monotypic.

1271. O. VICTORIAE Bell, 1902. Nat. hist. Southern Cross, p. 219, pl. 28, f. 1–6.

2 specimens, including 1 cotype. Antarctica: South Victoria Land, off Cape Adare, 20–24 fms.; Île Wandel or possibly Île Anvers?

Ophiogona.

Studer, 1876. Monatsb. K.-Preus. akad. wiss. Berlin, p. 460.

Type-species: *Ophiogona laevigata* Studer, 1876. *loc. cit.* Monotypic.

1272. O. LAEVIGATA Studer, 1876. Monatsb. K.-Preus. akad. wiss. Berlin, p. 460. 1882. Gazelle Oph., p. 6, pl. 1, f. 2*a-c*.

1 cotype. Kerguelen Island.

Ophioplinthus.

Lyman, 1878. Bull. M. C. Z., **5**, p. 105.

Type-species: *Ophioplinthus medusa* Lyman, 1878. *loc. cit.* Type here first designated.

1273. O. GRISEA Lyman, 1878. Bull. M. C. Z., **5**, p. 106, pl. 2, f. 33, 34.

1 cotype. Antarctica: off Kaiser Wilhelm II Land, 1975 fms.

1274. O. MEDUSA Lyman, 1878. Bull. M. C. Z., **5**, p. 105, pl. 2, f. 30, 31, 40.

2 cotypes. Antarctica: off Kaiser Wilhelm II Land, 1975 fms.

Ophiopleura.

Danielssen and Koren, 1877. Nyt mag. naturvid., **23**, p. 77.

Type-species: *Ophiopleura borealis* Danielssen and Koren, 1877. *loc. cit.* Monotypic.

1275. O. BOREALIS Danielssen and Koren, 1877. Nyt mag. naturvid., **23**, p. 77, pl. 5, f. 1–4. Koehler, 1909. Princesse-Alice Echinod., pl. 6, f. 4 (colored).

12 specimens, including 1 cotype. Off Franz Josef Land, 171–180 fms. Karahavet. South of Jan Mayen, 371 fms. Norway: off Kristiansund, 525 fms.

Ophiocten.

Lütken, 1855. Vid. med. f. 1854, p. 102.

Type-species: *Ophiocten kröyeri* Lütken, 1855. *loc. cit.* = *Ophiura sericea* Forbes, 1852. Monotypic when established.

1276. O. AMITINUM Lyman, 1878. Bull. M. C. Z., **5**, p. 100, pl. 5, f. 129, 130.

7 specimens, including 3 cotypes. Patagonia: off east coast, 60 fms. Kerguelen Island, 120 fms. Southwest from Australia, 1950 fms.

1277. O. HASTATUM Lyman, 1878. Bull. M. C. Z., **5**, p. 103, pl. 5, f. 133, 134.

2 cotypes. Near Marion Island, 1375 fms.

1278. O. PACIFICUM Lütken and Mortensen, 1899. Mem. M. C. Z., **32**, p. 131, pl. 3, f. 5–7.

63 specimens, including 9 cotypes. Off Washington, 859 fms. California: off Santa Rosa Island, 534 fms.; off Santa Cruz Island, 640 fms.; off San Nicolas Island, 451 fms. Lower California: off Pt. San Tomas, 868–1090 fms.; off Rosario Bay, 930 fms.; off Cedros Island, 525 fms. Gulf of Panama, 1270 fms. East of Galapagos Islands, 1322 fms. Japan: off east coast, 501–749 fms.; off Omai Saki Light, 624 fms.; Sagami Sea, 622 fms.

1279. O. PALLIDUM Lyman, 1878. Bull. M. C. Z., **5**, p. 102, pl. 5, f. 126–128.

4 cotypes. Southwest from Australia, 1975 fms. South from Australia, 2600 fms.

1280. O. PATTERSONI Lyman, 1883. Bull. M. C. Z., **10**, p. 244, pl. 4, f. 46–48.

Holotype. South of Marthas Vineyard, 129 fms.

1281. O. SERICEUM (Forbes).

Ophiura sericea Forbes, 1852. Journ. Sutherland's voy., **2**, p. 215 App.

Ophiocten sericeum Ljungman, 1864. Öfv. Kongl. Vet.-akad. Förh., **21**, p. 360. See Lütken, 1858. Add. ad hist. Oph., pt. 1, pl. 1, f. 5*a–d* (as *Ophiocten kröyeri*).

22 specimens. Spitzbergen[1]: Treurenberg Bay, 30 fms. Karahavet. Norway[1]: Lofoden Islands, 200–300 fms. Greenland. Off Georges Bank, 110 fms.

1282. O. UMBRATICUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 101, pl. 5, f. 131, 132.

1 COTYPE. OFF MOUTH OF THE RIO DE LA PLATA, 2650 fms.

Species of Ophiocten not represented in the M. C. Z.

1283. O. ABYSSICOLUM (FORBES), 1843. Trans. Linn. soc., **19**, p. 146, pl. 13, f. 8–14 (*Ophiura*). Aegean Sea, 150–200 fms.

1284. O. DUBIUM KOEHLER, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 20, pl. 6, f. 40, 41. West Antarctica, 162–333 fms.

1285. O. LATENS KOEHLER, 1906. Mem. Soc. zool. France, **19**, p. 13, pl. 1, f. 9, 10. Northeast from the Azores, 2240 fms.

1286. O. LEDANTECI KOEHLER, 1895. Rev. biol. Nord France, **7**, p. 58. 1896. Ann. Univ. Lyon, **26**, pl. 3, f. 26, 27. Bay of Biscay, 945 fms.

1287. O. LUDWIGI KOEHLER, 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 599, pl. 11, f. 100, 101. Antarctic Ocean, 1410–1775 fms.

1288. O. LYMANI STUDER, 1882. Gazelle Oph., p. 22, pl. 3, f. 10*a–e* (*Ophiochiton*). Southern Indian Ocean, 779–884 fms.

1289. O. MEGALOPLAX KOEHLER, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 22, pl. 6, f. 38, 39. West Antarctica, 200 fms.

1290. O. SCUTATUM KOEHLER, 1896. Mem. Soc. zool. France, **9**, p. 206. 1898. Hirondelle, Ech. et Oph., p. 44, pl. 7, f. 30, 31. Bay of Biscay, 88 fms. Off southwestern Ireland, 82 fms. Off southeastern Newfoundland, 86 fms.

OPHIOMUSIUM.

LYMAN, 1869. Bull. M. C. Z., **1**, p. 322.

Type-species: *Ophiomusium eburneum* LYMAN, 1869. *loc. cit.* Monotypic when established.

1291. O. ACUFERUM LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 7, pl. 1, f. 1–5.

223 specimens, including HOLOTYPE and 35 PARATYPES. Gulf of Mexico 84–220 fms. Florida: OFF WEST COAST, 42 fms. Cuba: off southwestern coast, 300 fms.; off Havana, 80–175 fms. Jamaica: off Port Royal, 100 fms. Off St. Cruz, D. W. I., 115 fms. Off Saba Bank, 150 fms. Off St. Kitts, 60–180 fms. Off Montserrat, 88 fms. Off Dominica, 118 fms. Off Martinique, 170–191 fms. Off St. Lucia, 116 fms. Off St. Vincent, 95–114 fms. Off Grenada, 92 fms. OFF BARBADOS, 56–288 fms.

1292. O. ARCHASTER LYMAN, 1878. Bull. M. C. Z., **5**, p. 112, pl. 2, f. 28, 29, 32.

1 COTYPE. OFF ARGENTINA, 1900 fms.

[1] Without definite locality.

1293. O. ARMIGERUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 109, pl. 1, f. 21, 22.

22 specimens, including 4 COTYPES. MID-ATLANTIC, 1850 fms. Between Cape May and Nantucket, 1731–2033 fms.

1294. O. CANCELLATUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 111, pl. 1, f. 17, 18.

4 specimens. Japan: in Colnett Strait, 1008 fms.; Bungo Channel, 405–578 fms.; Sagami Sea, 369–405 fms.

1295. O. CORTICOSUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 110, pl. 1, f. 19, 20.

1 COTYPE. Caroline Islands: 50 MILES OFF FARAULEP, 1850 fms.

1296. O. EBURNEUM LYMAN, 1869. Bull. M. C. Z., **1**, p. 322. 1871. Illus. cat. M. C. Z., no. 6, pl. 2, f. 1–3.

27 specimens, including HOLOTYPE. Gulf of Mexico, 220 fms. Florida: WEST OF SAND KEY, 325 fms. Cuba: off Chorrera, 270 fms.; off Havana, 127–400 fms. Off Santa Cruz, D. W. I., 115 fms. Off Guadeloupe, 196 fms. Off Dominica, 390 fms. Off Martinique, 118–213 fms. Off St. Lucia, 164–226 fms. Off St. Vincent, 95–124 fms. Off the Grenadines, 127 fms. Off Grenada, 159–262 fms. Off Barbados, 200–221 fms.

1297. O. FAMILIARE KOEHLER, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 303, pl. 6, f. 20, 21.

1 specimen. Off the southern Andaman Islands, 378 fms.

1298. O. GLABRUM LÜTKEN and MORTENSEN, 1899. Mem. M. C. Z., **23**, p. 132, pl. 4, f. 7–9.

38 specimens, including 23 COTYPES. Lower California: off Pt. San Tomas, 868–1090 fms.; off Ballenas Bay, 930 fms. GULF OF PANAMA, 978–1823 fms. OFF ECUADOR, 1740 fms.

1299. O. GRANOSUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 118, pl. 1, f. 12, 13.

1 COTYPE. PACIFIC OCEAN, EASTWARD FROM JAPAN, 1875 fms.

1300. O. JOLLIENSE MCCLENDON, 1909. Univ. Cal. publ. Zool., **6**, p. 36, pl. 1, f. 2, 3.

19 specimens. Off Washington, 345 fms. Off Central California, 456 fms.

1301. O. LAQUEATUM LYMAN, 1878. Bull. M. C. Z., **5**, p. 113, pl. 1, f. 14–16.

1 specimen. Japan: off Kagoshima Gulf, 103 fms.

1302. O. LUNARE LYMAN, 1878. Bull. M. C. Z., **5**, p. 116, pl. 1, f. 4–6.

2 specimens. Japan: off Kagoshima Gulf, 103 fms.

1303. O. LÜTKENI LYMAN, 1878. Bull. M. C. Z., **5**, p. 114, pl. 5, f. 138–140.

3 specimens, including 1 COTYPE. Japan: southwest of the Goto Islands, 139 fms. Dutch East Indies: NEAR KEI ISLANDS, 129 fms.

1304. O. LYMANI Wyville Thomson, 1873. Depths of the sea, p. 172, f. 32, 33. Koehler, 1909. Princesse-Alice Echinod., pl. 3, f. 4; pl. 4, f. 1 (colored).

747 specimens. Off southwestern Ireland, 982 fms. Bay of Biscay, 1525 fms. South of Nova Scotia, 980–1250 fms. Off Nantucket, 1098 fms. East of Nantucket, 810–1242 fms. South of Marthas Vineyard, 466–1241 fms. Off New Jersey, 1394 fms. Off Delaware, 740–1186 fms. Off Cape Hatteras, 898 fms. Off South Carolina, 464–647 fms. Off Georgia, 1047 fms. Lower California: off Point San Tomas, 1090 fms.; off Rosario Bay, 879 fms. Mexico: off Mazatlan, 995 fms. Gulf of Panama, 978–1067 fms. Japan: off Shio Misaki Light, 544–587 fms.; off Omai Saki Light, 624–662 fms.; off east coast, 535 fms. Dutch East Indies: off Aru Islands, 800 fms.

1305. O. MONOPLAX, sp. nov. (*μόνος*, single + *πλάξ*, plate). Plate **20**, f. 9, 10.

Disk 12 mm. in diameter; arms about 35 mm. long. Very similar to *O. serratum* but differing constantly in the following characters. There is no trace of an arm-comb nor of granules at the base of the arm, near the radial shields, such as occur in *serratum*. The upper arm-plates are triangular, of moderate size, wider than long (or at least not narrower), while in *serratum* they rapidly become very small and are decidedly longer than wide. The under arm-plates are also different in the two species; in both, the first is very small, the second is largest of all, while the third and fourth are not much smaller; but in *serratum* the fifth is somewhat smaller than the fourth though not of very different shape and the succeeding plates decrease in size rapidly but remain distinctly wider than long and are not triangular; while in *monoplax*, the fifth is markedly smaller than the fourth and of different shape, being distinctly triangular as are the succeeding plates which steadily diminish in size. In *serratum* there are half a dozen low, wide oral papillae, while the point of the jaw bears the lowest tooth; in *monoplax*, there are 7–9 papillae, the proximal all pointed, and a pair of them occupy the tip of the jaw. Instead of 4–6 sharp, unequal arm-spines, characteristic of *serratum*, there are 6 or 7 blunt, equal spines in *monoplax*, shorter than those of its near relative. Finally, in *monoplax* each of the six tentacle-pores (three pairs) is covered almost wholly by a single large oral tentacle-scale (hence the name), attached to the side arm-plate. In his description of *serratum*, Lyman says there is "a single, circular tentacle-scale" on the "under arm plates," but the figure in the Challenger report (Plate 2, f. 1) shows clearly the real condition in that species, one or two low imperfect scales on both the under and the side arm-plates. Color (dry), nearly white.

Holotype (M. C. Z. 508) and 14 paratypes (M. C. Z. 509–516, 882).

Cuba: off Cape Cruz, 206 fms.; off Havana, 480 fms. Off St. Cruz, D. W. I., 451–508 fms. Off Dominica, 333 fms. Off Martinique, 334–476 fms. Off St. Lucia, 422 fms. Off St. Vincent, 464 fms. Off Barbados, 399 fms. All from the Blake collections. These specimens were labeled *O. serratum* by Mr. Lyman and are recorded in his Blake report under that name, but the differences pointed out above make a combination of characters which is too constant and too important to ignore. I have found no specimens which are intermediate between the two forms and have no doubt each is a valid, natural species.

1306. O. MULTISPINUM H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 133, f. 42.

1 paratype. Off Washington, 877 fms.

1307. O. OLIGOPLACUM, sp. nov. (ὀλίγος, few + πλάξ, plate). Plate **20**, f. 7, 8.

Disk 5 mm. in diameter; arms more than 20 mm. long, very attenuate. Similar to *testudo* in most particulars but differing in several important ones. Chief of these is the arm-spines, which are six (five and then four distally) sharp, short, subequal and well-spaced, instead of two or three peg-like ones crowded near middle of side arm-plate. The disk-plates are very few (hence the name), only 16 instead of 25–40 in *testudo* of about the same size. The radial shields are closely joined for their entire length, instead of being separated proximally by a large scale. The adoral plates are very large and the oral shields are rounded pentagonal almost as wide as long instead of being almost triangular and much longer than wide. As in *testudo*, there are only two pairs of tentacle-pores on each arm and the upper and under arm-plates are confined to the basal joints. Color (dry), nearly white.

Holotype (M. C. Z. 526). Cuba: off Havana, 250–400 fms. Blake Station 100.

This specimen is labeled *O. testudo* but no doubt Mr. Lyman failed to examine it critically and so did not notice the characteristic arm-spines. Although the near relationship to *testudo* need not be questioned, comparison with specimens of that species having nearly the same disk diameter demonstrates beyond doubt that *oligoplacum* is a perfectly distinct species.

1308. O. PLANUM Lyman, 1878. Bull. M. C. Z., **5**, p. 218, pl. 3, f. 46–48.

6 specimens, including holotype and 1 paratype. Gulf of Mexico, 955 fms. Off coast of Portugal, (470 or) 1090 fms. Arabian Sea: off mouth of the Indus, 1506 fms.

1309. O. RUGOSUM Koehler, 1914. Bull. 84 U. S. N. M., p. 26, pl. 1, f. 7, 8.

4 specimens. Off Montserrat, 120 fms. Off St. Vincent, 114 fms.

1310. O. SERRATUM Lyman, 1878. Bull. M. C. Z., **5**, p. 109, pl. 1, f. 23–25.

15 specimens. Cuba: off Havana, 272–450 fms. Off Jamaica, 322 fms. Off St. Cruz, D. W. I., 450–508 fms. Off Virgin Gorda, 1097 fms. Off Martinique, 213–476 fms. Off Barbados, 221 fms.

1311. O. SIMPLEX Lyman, 1878. Bull. M. C. Z., **5**, p. 115, pl. 1, f. 10, 11.

3 specimens. Japan: southwest of the Goto Islands, 95–139 fms.

1312. O. TESTUDO Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 8, pl. 1, f. 6–8.

35 specimens, including the HOLOTYPE. Cuba: off Havana, 80–450 fms. Off Isle of Pines, 300 fms. Off St. Cruz, D. W. I., 115–508 fms. Off Montserrat, 88–148 fms. Off Dominica, 118–130 fms. Off St. Vincent, 88 fms. Off Grenada, 92 fms. Off Barbados, 69–100 fms.

1313. O. TRYCHNUM H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 109, f. 40.

8 PARATYPES. Japan: off east coast, 191 fms.; off Seno Umi, 94–150 fms.; off Uraga Strait, 70 fms.; off Suruga Gulf, 108–131 fms.

1314. O. VALIDUM Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 618. Lyman, 1878. Bull. M. C. Z., **5**, p. 114, pl. 1, f. 7–9.

94 specimens. Gulf of Mexico, 955–1568 fms. Cuba: off Havana, 175–805 fms.; east of Havana, 292 fms.; off Bahia Honda, 860 fms.; off Cape Maysi, 772 fms. Off Grand Cayman, 608 fms. Yucatan: off Chincorro Bank, 600 fms. Off Jamaica, 322 fms. Off Porto Rico, 874 fms. Off St. Cruz, D. W. I., 248–580 fms. Off St. Kitts, 60–270 fms. Off Guadeloupe, 583–878 fms. Off Dominica, 542–608 fms. Off Martinique, 317–501 fms. Off St. Vincent, 573–785 fms. Off Cannouan, 127 fms. Off Grenada, 159–553 fms.

1315. O. VARIABILE Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 135, pl. 4, f. 4–6.

2 COTYPES. Mexico: OFF ACAPULCO, 493 fms.

Species of Ophiomusium not represented in the M. C. Z.

1316. O. AFRICANUM Koehler, 1909. Princesse-Alice Echinod., p. 159, pl. 1, f. 10 (colored); pl. 29, f. 5, 6. Near Cape Verde Islands, 122 fms.

1317. O. ALTUM Koehler, 1904. Siboga-exp. Oph. mer prof., p. 57, pl. 10, f. 2–4. Dutch East Indies: Strait of Macassar, 1127 fms.

1318. O. DIOMEDEAE Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 134, pl. 4, f. 1–3. Galapagos Islands, 385 fms.

1319. O. ELEGANS Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 305, pl. 6, f. 22, 23. Laccadive Islands, 406 fms. Andaman Islands, 490 fms.

1320. O. FALLAX Koehler, 1904. Siboga-exp. Oph. mer prof., p. 56, pl. 9, f. 10, 11; pl. 10, f. 1. Dutch East Indies: near Waigeu, 260 fms.

1321. O. IMPURUM Koehler, 1904. Siboga-exp. Oph. mer prof., p. 64, pl. 10, f. 8–10. Dutch East Indies: north of Tanah Djampeah, 66–223 fms.; Kei Islands, 170 fms.

1322. O. PROPERUM Koehler, 1904. Siboga-exp. Oph. mer prof., p. 62, pl. 10, f. 11–13. Dutch East Indies: Celebes, near Dongala Bay, 402 fms.; Paternoster Islands, 386 fms.

1323. O. RELICTUM Koehler, 1904. Siboga-exp. Oph. mer prof., p. 61, pl. 10, f. 5–7. Dutch East Indies: near Waigeu, 260 fms.

1324. O. SCALARE Lyman, 1878. Bull. M. C. Z., **5**, p. 117, pl. 1, f. 1–3. Near Kermadec Islands, 600 fms.

1325. O. SCULPTUM Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 16, pl. 2, f. 2; pl. 8, f. 2. Cuba: off Havana, 110–260 fms.

1326. O. STELLATUM Verrill, 1899. Bull. Univ. Iowa, new ser., **1**, no. 6, p. 14, pl. 1, f. 3, 3*a*. Cuba: off Havana, 110–260 fms.

Ophiolipus.

Lyman, 1878. Bull. M. C. Z., **5**, p. 220.

Type-species: *Ophiolipus agassizii* Lyman, 1878. *loc. cit.* Monotypic when established.

1327. O. AGASSIZII Lyman, 1878. Bull. M. C. Z., **5**, p. 220, pl. 3, f. 52–54.

Holotype and 32 paratypes. Gulf of Mexico: off the delta of the Mississippi River, 118 fms.

Species of Ophiolipus not represented in the M. C. Z.

1328. O. GRANULATUS Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 315, pl. 6, f. 28, 29. Andaman Islands, 112 fms.

1329. O. LEVIS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 21, pl. 4, f. 4–6. Dutch East Indies: near Waigeu, 260 fms.; north of Ceram, 464 fms.

Ophiophyllum.

Lyman, 1878. Bull. M. C. Z., **5**, p. 130.

Type-species: *Ophiophyllum petilum* Lyman, 1878. *loc. cit.* Monotypic.

1330. O. PETILUM Lyman, 1878. Bull. M. C. Z., **5**, p. 130, pl. 7, f. 179–181. 1883. Bull. M. C. Z., **10**, p. 248, pl. 4, f. 52–54.

1 specimen. Off Dominica, 542 fms. Specific identity dubious.

Ophiopenia.

H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 102.

Type-species: *Ophiopenia disacantha* H. L. Clark, 1911. *loc. cit.* Type designated.

1331. O. DISACANTHA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 102, f. 38.

6 paratypes. Bering Sea, 45–74 fms. Unalaska: Captain's Harbor, 9–14 fms.

1332. O. TETRACANTHA H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 104, f. 39.

39 paratypes. Alaska: Kadiak Island, Chagofka Cove.

Ophiothyreus.

Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 619.

Type-species: *Ophiothyreus goësi* Ljungman, 1871. *loc. cit.* Monotypic.

1333. O. GOËSI Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 619. Koehler, 1904. Mem. Soc. zool. France, **17**, p. 59, f. 5–7.

19 specimens, including 2 cotypes. Cuba: off Havana, 80–250 fms. Off Isle of Pines, 300 fms. Off Anguilla, 200 fms. Off Montserrat, 88 fms.

Amphipholizona, gen. nov. (*Amphipholis* + *Ophiozona*).

Type-species: *Amphipholizona delicata*, sp. nov.

Disk covered by few, large plates and scales. Oral papillae as in Amphipholis; *i. e.*, 3 on each side, the distalmost largest, the proximal one block-like and infradental in position. Peristomal plates paired, very large. Genital plates not soldered to basal vertebrae. Tentacle-scales confined to basal arm-joints but tentacles continuous to tip of arm. Second oral tentacles entirely concealed within mouth slit. Genital slits short; no genital papillae and no arm-comb. Arm-spines, at least on basal joints, long and flaring.

This genus shows a remarkable combination of characters, the oral surface being very amphiurid-like, while the dorsal side of the disk is like Ophiozona. It has seemed best to put it in the Ophiolepididae in view of the characters shown by the disk and the internal plates but it is not very like to any genus hitherto known in that family, though perhaps most similar to Ophioceramis.

1334. A. DELICATA, sp. nov. Plate **20**, f. 1, 2.

Disk 3 mm. in diameter; arms nearly 18 mm. long, relatively wide at base, but tapering soon to an attenuate tip. Disk covered by the radial shields, 16 large plates and 15 scales; there is a central plate, 5 radials forming a closed ring around it, and in each interradius, 2 large, squarish, interradials, a distal and a proximal; between each radial plate and each pair of radial shields is a

transverse row of 3 small triangular scales. (In the holotype, the 6 primary plates are asymmetrically arranged and the same is true of several other specimens). Radial shields rather large, united for their whole length, the pair forming an almost perfect semicircle, distal to which the contiguous ends of the genital scales project. Upper arm-plates wider than long, rounded triangular, the proximal angle truncated on the basal joints where the plates are more or less in contact; at the middle of the arm and distally they are fully separated. Interbrachial areas below covered by 12–15 scales. Oral shields small, not so large as one of the adoral plates; diamond-shape and longer than wide, or distal angle truncated and then width and length about equal. Adoral plates very large, narrower within than without but fully in contact with each other. Oral plates very small. Oral papillae 3 on each side, a block-like infradental one, a smaller flat scale on the edge of the oral plate and a large, flat scale twice as wide as high, partly on the oral, and partly on the adoral, plate; the median and distal papillae close the oral slit, as in Amphipholis. First under arm-plate very small, nearly square; succeeding plates pentagonal (with proximal angle), much wider than long, distally becoming minute and squarish; only two or three basal ones are in contact. Side arm-plates rather large and projecting, meeting both above and below except at base of arm; each one bears a vertical series of slender, pointed arm-spines, 6 on the first joint outside the disk, then 5 on one or two joints, then 4 to the middle of the arm and 3 distally; the next to the uppermost is longest and equals (at first) about a joint and a half, but at the middle of the arm it hardly equals a joint. On the tentacle-pores of 3 or 4 basal joints, there is a single well-developed tentacle-scale, but beyond that there are none, although the tentacles are evident clear to the tip of the arm. Color, nearly white.

Holotype (M. C. Z. 785) and 18 paratypes (M. C. Z. 832, 833, 3929). Off Barbados, 76–103 fms. Blake Stations 272, 273 and 293.

These specimens are labeled "*Ophiozona antillarum*" and yet only one of the three lots is listed in the Blake report under that species. Mr. Lyman apparently was at first inclined to think them young Ophiozonas but was not satisfied with such a disposition of them. It is worth noting that they are from much shallower water than any *antillarum* in the M. C. Z. collection. In view of the peculiar mouth-parts and the arrangement of the tentacles and their scales, I do not think these little brittle-stars can be referred to either Ophiozona or Ophioceramis.

Ophioceramis.

Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 62.

Type-species: *Ophiolepis januarii* Lütken, 1856. Vid. med., p. 10. Monotypic when established.

1335. O. ALBIDA (Ljungman).
Amphipholis albida Ljungman, 1867. Öfv. Kongl. Vet.-akad. Förh., **23**, p. 314.
Ophioceramis albida Lyman, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 10, pl. 3, f. 29–31.

45 specimens. Off Barbados, 100 fms. Brazil: Rio Janeiro; off Rat Island. Off Rio de la Plata, 19 fms. Argentina: off Capo Corrientes, 44 fms.; off Punta Rasa, 30 fms.; off Capo dos Bahios.

1336. O. JANUARII (Lütken).
Ophiolepis januarii Lütken, 1856. Vid. med., p. 10. 1859. Add. ad hist. Oph., pt. 2, p. 108, pl. 2, f. 1*a–c*.
Ophioceramis januarii Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 62.

76 specimens. Off Barbados, 100 fms. (very young: identity dubious). Brazil: off Bahia, 40 fms.; off Cape Frio, 35 fms. Argentina: off San Matias Bay.

Species of Ophioceramis not represented in the M. C. Z.

1337. O. ANTARCTICA Studer, 1885. Jahrb. wiss. anst. Hamburg, **2**, p. 160, pl. 2, f. 7*a*, *b*. South Georgia Islands.

1338. O. DECLINANS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 15, pl. 3, f. 8, 9. Dutch East Indies: near Kei Islands, 114 fms.

Ophiozona.

Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 64.

Type-species: *Ophiolepis impressa* Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 101. Type here first definitely designated.

1339. O. IMPRESSA (Lütken).
Ophiolepis impressa Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 101, pl. 2, f. 3*a*, *b*.
Ophiozona impressa Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 64.

48 specimens. West Indies.[1] Cuba[1]. Off Isle of Pines, 300 fms. Jamaica: Montego Bay; Port Antonio; Kingston. St. Cruz, D. W. I., 115 fms. St. Thomas, D. W. I. Guadeloupe. Off Barbados, 69–221 fms.

1340. O. PACIFICA (Lütken).
Ophiolepis pacifica Lütken, 1856. Vid. med., p. 22. 1859. Add. ad hist. Oph., pt. 2, p. 104, pl. 2, f. 4*b–d*.
Ophiozona pacifica Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 64, 67.

3 specimens. Panama[1]: Pearl Islands.

[1] Without definite locality.

Ophiozonella.

Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

Type-species: *Ophiozona longispina* H. L. Clark, 1908. Bull. M. C. Z., **51**, p. 290. Type designated.

1341. O. ALBA (Lütken and Mortensen).
Ophiozona alba Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p 102, pl. 6, f. 7–9.
Ophiozonella alba Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

3 cotypes. Off Cocos Island, 770–1175 fms. Off Galapagos Islands,1360 fms.

1342. O. ANTILLARUM (Lyman).
Ophiozona antillarum Lyman, 1878. Bull. M. C. Z., **5**, p. 127, pl. 6, f. 152–154.
Ophiozonella antillarum Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

12 specimens. Off St. Cruz, D. W. I., 508 fms. Off Martinique, 213–476 fms. Off Barbados, 200–399 fms.

1343. O. CLYPEATA (Lyman).
Ophiozona clypeata Lyman, 1883. Bull. M. C. Z., **10**, p. 234, pl. 3, f. 13–15.
Ophiozonella clypeata Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

3 specimens, including holotype and 1 paratype. Off Montserrat, 148 fms. Off St. Lucia, 151 fms. Off St. Vincent, 88 fms.

1344. O. CONTIGUA (Lütken and Mortensen).
Ophiozona contigua Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 101, pl. 6, f. 10–12.
Ophiozonella contigua Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

1 cotype. Off the Galapagos Islands, 1322 fms.

1345. O. DEPRESSA (Lyman).
Ophiozona depressa Lyman, 1878. Bull. M. C. Z., **5**, p. 128, pl. 6, f. 155–157.
Ophiozonella depressa Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

1 cotype. Off the Meangis Islands, 500 fms.

1346. O. ELEVATA (H. L. Clark).
Ophiozona elevata H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 31, f. 6.
Ophiozonella elevata Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

1 paratype. Japan: off Goto Islands, 95–106 fms.

1347. O. INSULARIA (Lyman).
Ophiozona insularia Lyman, 1878. Bull. M. C. Z., **5**, p. 126, pl. 6, f. 149–151.
Ophiozonella insularia Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

1 cotype. Near Fiji Islands, 310–315 fms.

1348. O. LONGISPINA (H. L. Clark). Plate **20**, f. 5, 6.
Ophiozona longispina H. L. Clark, 1908. Bull. M. C. Z., **51**, p. 290.
Ophiozonella longispina Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

34 specimens, including HOLOTYPE and 5 PARATYPES. Japan: off eastern coast, 55–337 fms.; off Ose Saki, 60–70 fms.; URAGA CHANNEL, 70 fms.

1349. O. MARMOREA (LYMAN).

Ophiozona marmorea LYMAN, 1883. Bull. M. C. Z., **10**, p. 233, pl. 3, f. 10–12.
Ophiozonella marmorea MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

31 specimens, including HOLOTYPE and 7 PARATYPES. Cuba: OFF HAVANA, 175–250 fms. OFF ST. CRUZ, D. W. I., 248 fms. OFF MONTSERRAT, 148 fms. OFF GUADELOUPE, 150 fms. Off St. Lucia, 116 fms. OFF ST. VINCENT, 114 fms. Off Carriacou, 163 fms. Off Barbados, 103 fms.

1350. O. NIVEA (LYMAN).

Ophiozona nivea LYMAN, 1875. Illus. cat. M. C. Z., no. 8, pt. 2, p. 9, f. 85, 86.
Ophiozonella nivea MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

587 specimens, including HOLOTYPE and 1 PARATYPE. Cuba: off Havana, 177–242 fms.; off Bahia Honda, 287 fms.; OFF CAPE SAN ANTONIO, 424 fms. Off Isle of Pines, 300 fms. St. Cruz, D. W. I.: off Frederickstadt, 314 fms. Off St. Kitts, 208–270 fms. Off Montserrat, 298 fms. Off Guadeloupe, 62–170 fms. Off Dominica, 250 fms. Off Martinique, 189–213 fms. Off St. Lucia, 151–226 fms. Off St. Vincent, 114 fms. Off Cannouan, 127 fms. Off Carriauco, 163 fms. Off Grenada, 159 fms. Off Barbados, 56–221 fms.

1351. O. PLATYDISCA (H. L. CLARK).

Ophiozona platydisca H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 34, f. 7.
Ophiozonella platydisca MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

1 PARATYPE. Japan: OFF HIRO MISAKI LIGHT, 191 fms.

1352. O. POLYPLAX (H. L. CLARK).

Ophiozona polyplax H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 35, f. 8.
Ophiozonella polyplax MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

1 PARATYPE. Japan: OFF SHIO MISAKI LIGHT, 440 fms.

1353. O. STELLATA (LYMAN).

Ophiozona stellata LYMAN, 1878. Bull. M. C. Z., **5**, p. 125, pl. 6, f. 147, 148.
Ophiozonella stellata MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

1 COTYPE. NEW ZEALAND: OFF EAST COAST, 1100 fms.

1354. O. TESSELLATA (LYMAN).

Ophiozona tessellata (LYMAN) 1878. Bull. M. C. Z., **5**, p. 223, pl. 3, f. 43–45.
Ophiozonella tessellata MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 82.

30 specimens, including HOLOTYPE. Off Isle of Pines, 300 fms. CUBA: BETWEEN ISLE OF PINES AND ZAPATA PENINSULA, 242 fms. Off St. Cruz, D. W. I., 248 fms. Off St. Kitts, 60–180 fms. Off Montserrat, 88–148 fms. Off

Guadeloupe, 150 fms. Off Martinique, 213 fms. Off St. Lucia, 116 fms. Off St. Vincent, 95 fms. Off Cannouan, 127 fms. Off Barbados, 100–154 fms.

Species of Ophiozonella not represented in the M. C. Z.

1355. O. BISPINOSA (Koehler), 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 319, pl. 6, f. 32, 33 (*Ophiozona*). Andaman Islands, 112 fms.

1356. O. CASTA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 22, pl. 5, f. 9; pl. 6, f. 1, 2 (*Ophiozona*). Dutch East Indies: Kei Islands, 312 fms.

1357. O. MOLESTA (Koehler), 1904. Siboga-exp. Oph. mer prof., p. 23, pl. 6, f. 3–5 (*Ophiozona*). Sulu Archipelago, 706 fms.

1358. O. PROJECTA (Koehler), 1905. Siboga-exp. Oph. litt., p. 19, pl. 1, f. 16–18 (*Ophiozona*). Dutch East Indies: several stations, 8–63 fms.

1359. O. SINCERA (Koehler), 1906. Mem. Soc. zool. France, **19**, p. 11, pl. 1, f. 11, 12 (*Ophiozona*). Off northwestern Spain, 680–889 fms.

1360. O. TJALFIANA (Mortensen), 1913. Vid. med., **66**, p. 38, f. 2, 3 (*Ophiozona*). Off west coast of Greenland, 612 fms.

Ophiozonoida, gen. nov. (*ὀφιοζώνα* + *εἶδος*).

Type-species: *Ophiozonoida picta*, sp. nov.

Similar to Ophiozona but differing in three particulars:— (1) oral papillae 3 or 4 on each side, the proximal pair infradental in position, thick and squarish, somewhat as in Amphipholis; (2) arm-spines short and stout, extending outwards form the more or less flaring side arm-plates; (3) tentacle-scale single, large, nearly circular, attached to the side arm-plate.

The character of the arm-spines and the arrangement and form of the oral papillae seem to warrant keeping this novelty out of Ophiozona. The disk, however, is elevated, and is covered with large plates intermingled with small scales much as in that genus, so there is even more reason for not referring the present species to Ophiozonella. The disk-plates are not notably thickened on their distal margins but are smooth and of nearly uniform thickness.

1361. O. PICTA, sp. nov. (*pictum*, copied in colors). Plate **18**, f. 3, 4.

Disk 3.5 mm. in diameter; arms about 10 mm. long. Disk covered with large plates, intermingled with small scales; in the holotype it is difficult to make out a definite arrangement but in the other specimens there is a large central plate, 5 radial plates nearly as large, 5 pairs of somewhat smaller interradial plates (1 proximal, 1 distal and marginal) and a still smaller radial plate separating the proximal ends of each pair of radial shields; some 50 or more scales surround, more or less imperfectly, or are mingled with these plates.

Radial shields small, separated for their entire length (or, in the smallest specimen, in contact distally), with 3 relatively large plates distal to them and separating them from the upper arm-plates. The middle one of these three plates is the smallest; it is in contact distally with the first upper arm-plate and proximally with the radial series of disk-plates; such an arrangement of plates distal to the radial shields is evident in most specimens of Ophiozona. First upper arm-plate quadrilateral, very short, three times as wide as long; second plate similar but much larger; third much larger still and only twice as wide as long; these three plates are broadly in contact; succeeding plates rapidly becoming rounded triangular (with proximal angle) and at middle of arm and distally, separated from each other. Interbrachial areas below covered with about a dozen scales. Oral shields pentagonal; distal margin convex but the other four sides somewhat concave; breadth and length about equal; madrepore decidedly larger than the others. Adoral plates moderately large, fully in contact within; oral plates minute for the jaws are short. Oral papillae not very large; proximal one of each series, infradental in position, thick and squarish; second one smaller and more scale-like; there then follows either the large, scale-like distal papilla or preceding it may be another small one. First under arm-plate large (bigger than an adoral plate), much wider than long; succeeding plates longer than wide, bell-shaped, the lateral margins concave and the distal end much wider than the proximal; the basal ones are slightly in contact and it is only on the distal part of the arm that they are clearly separated. Side arm-plates somewhat flaring, with slightly thickened distal margins, in contact above and below on distal part of arm at least; each plate carries 3 short, stout, blunt, subequal arm-spines not at all appressed to arm; lowest spine about half as long as arm-joint or a little longer. Tentacle-scale, single, large, nearly circular, attached to side arm-plate. Colors (dry), dull but in very ornamental pattern (hence the name); small scales adjoining central plate, proximal part of each large radial plate, radial shields, and third, fifth and each alternate arm-joint beyond, dull brownish with a purple tinge; all other disk-scales and arm-joints whitish with more or less yellow tinge; many light upper arm-plates with a dusky spot; lower surface similarly but less regularly variegated; oral papillae and most tentacle-scales and arm-spines, whitish.

HOLOTYPE (M. C. Z. 3726) and 2 PARATYPES (M. C. Z. 3930). New Zealand: WELLINGTON, under stones near low-water mark. H. Farquhar coll.

With characteristic kindness, Mr. Farquhar gave these specimens to the Museum in August, 1913, expressing the hope that if new to science, as he

believed they were, comparison with the large amount of material available here would reveal their true relationship, since they were quite unlike any New Zealand brittle-stars with which he was familiar. It is interesting to find that their nearest relatives seem to be the two species of Ophiozona, a genus which in the original, and recently restricted, sense is known only from the Caribbean and Panamic regions.

Ophiomidas.

Koehler, 1904. Siboga-exp. Oph. mer prof., p. 26.

Type-species: *Ophiomidas alatum* Koehler, 1904. *loc. cit.* Type here first definitely designated.

1362. O. DUBIUS (Lyman).
Ophiozona (?) *dubia* Lyman, 1878. Bull. M. C. Z., **5**, p. 224, pl. 2, f. 19–21.
Ophiomidas dubium Koehler, 1904. Siboga-exp. Oph. mer prof., p. 28.

Holotype. Gulf of Mexico, 539 fms.

Species of Ophiomidas not represented in the M. C. Z.

1363. O. ALATUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 26, pl. 5, f. 4, 5. Dutch East Indies: Strait of Macassar, 723 fms.

1364. O. REDUCTUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 27, pl. 5, f. 6–8. Dutch East Indies: north of Sumbawa, 1145 fms.

Ophiolepis.

Müller and Troschel, 1842. Syst. Ast., p. 83, 89.

Type-species: *Ophiura annulosa* Blainville, 1834. Man. d'Act., pl. 24. Type designated by Lyman, 1865. Since *O. annulosa* Bl. is not *O. annulosa* Lamarck, 1816, the name ought never to have been used. Müller and Troschel, Lütken, and Lyman all recognized the fact that Blainville's proposed name was a homonym but curiously enough none of them suggested a substitute. So that down to the present time we have an *Ophiura annulosa* serving as the type of Ophiomastix, while another *Ophiura annulosa* is the type of Ophiolepis. A new name for Blainville's species has therefore been suggested recently. (See p. 343).

1365. O. CINCTA Müller and Troschel, 1842. Syst. Ast., p. 90. Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 101, pl. 2, f. 6*a*, *b*. Lyman, 1865. Illus. cat. M. C. Z., **1**, pl. 2, f. 4, colored (as *O. garretti*).

41 specimens. Zanzibar. Red Sea. Philippine Islands. Amboina. Torres Strait: Thursday Island; Badu; Murray Islands, Mer. New South Wales: Port Jackson. Caroline Islands: Ponape. Society Islands.

1366. O. ELEGANS Lütken, 1859. Add. ad hist. Oph., pt. 2, p. 105. Lyman, 1865. Illus. cat. M. C. Z., no. 1, p. 58, pl. 2, f. 5 (colored).

25 specimens. South Carolina: Charleston; off Port Royal, 29 fms. Flor-

ida [1]: off Charlotte Harbor, 13–30 fms.; Key West, 8½ fms.; south of Rebecca Shoal, 11 fms.; off Carysfort Reef, 40 fms.; southwest of the Tortugas, 15–25 fms. Cuba: Guadiana Bay; Bayo de Bahia de Cadiz. Mexico: Yucatan Bank, 20 fms. Jamaica: Kingston.

1367. O. PAUCISPINA (Say).

Ophiura paucispina Say, 1825. Journ. Acad. nat. sci. Phil., **5**, p. 149.
Ophiolepis paucispina Müller and Troschel, 1842. Syst. Ast., p. 90. Lütken, 1859. Add. ad hist. Oph., pt. 2, pl. 2, f. 2*a*, *b*.

48 specimens. Florida [1]: Biscayne Bay. Bahamas: off Double-headed Shot Key, 3–4 fms. Bermuda. West Indies.[1] Jamaica: Montego Bay; Port Antonio; Kingston. St. Thomas, D. W. I.

1368. O. SUPERBA H. L. Clark, 1915. Spolia Zeylanica, **10**. Lütken, 1859. Add. ad hist. Oph., pt. 2, pl. 2, f. 5*a*, *b* (as *O. annulosa*). Herklots, 1869. Echinod. peintes d'apres nature, pl. 4, f. 2 (colored).

30 specimens. Zanzibar. Philippine Islands. New Guinea [1]: Sorong. Torres Strait: Erub; Murray Islands, Mer. Solomon Islands. Caroline Islands: Ponape. Marshall Islands: Ebon.

1369. O. VARIEGATA Lütken, 1856. Vid. med., p. 23. 1859. Add. ad hist. Oph., pt. 2, p. 106, pl. 2, f. 7*a–d*.

2 specimens. Panama: Pearl Islands.

Species of Ophiolepis not represented in the M. C. Z.

1370. O. AFFINIS Studer, 1882. Gazelle Oph., p. 6, pl. 1, f. 3. West Africa: off Cameroon, 59 fms.

1371. O. IRREGULARIS Brock, 1888. Zeits. f. wiss. zool., **47**, p. 475. Koehler, 1905. Siboga-exp. Oph. litt., pl. 3, f. 1–3. Amboina.

1372. O. NODOSA Duncan, 1887. Journ. Linn. soc. Zool., **21**, p. 86, pl. 8, f. 1–3. Mergui Archipelago: Elphinstone Island.

1373. O. RUGOSA Koehler, 1898. Bull. sci., **31**, p. 64, pl. 2, f. 9, 10. Ceylon: off Galle, 34 fms.

Ophioplocus.

Lyman, 1861. Proc. Boston soc. nat. hist., **8**, p. 75.

Type-species: *Ophiolepis imbricata* Müller and Troschel, 1842. Syst. Ast., p. 93. Type designated by Lyman (footnote p. 76).

1374. O. ESMARKI Lyman, 1874. Bull. M. C. Z., **3**, p. 227. McClendon, 1909. Univ. Cal. publ., Zool., **6**, pl. 1, f. 6, 7.

7 specimens, including HOLOTYPE. California: San Diego.

[1] Without definite locality.

1375. O. IMBRICATUS (Müller and Troschel).
Ophiolepis imbricata Müller and Troschel, 1842. Syst. Ast., p. 93.
Ophioplocus imbricatus Lyman, 1861. Proc. Boston soc. nat. hist., **8**, p. 76, foot note. Herklots, 1869. Echinod. peintes d'apres nature, pl. 5, f. 1 (colored).

42 specimens. Zanzibar. Madagascar. Mauritius. Philippine Islands. Java. Amboina. Halmaheira. Torres Strait: Erub; Murray Islands, Mer. Gilbert Islands.

1376. O. JAPONICUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 30, f. 5.

15 specimens, including 4 PARATYPES. Japan[1]: mouth of Yeddo Bay; Misaki; Odawaro.

Species of Ophioplocus not represented in the M. C. Z.

1377. O. HUTTONI Farquhar, 1899. Proc. Linn. soc. N. S. W., **24**, p. 187, pl. 15, f. 1–3. New Zealand: Wellington, Lyall Bay.

Genera of Ophiolepididae not represented in the M. C. Z.

Ophiotypa Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 281.

1378. Type-species: OPHIOTYPA SIMPLEX Koehler, 1897. *loc. cit.*, pl. 5, f. 1–3. Monotypic. Bay of Bengal, 1997 fms.

Ophiochrysis Koehler, 1904. Siboga-exp. Oph. mer prof., p. 35.

1379. Type-species: OPHIOCHRYSIS ORNATA Koehler, 1904. *loc. cit.*, pl. 6, f. 6–8. Monotypic. Dutch East Indies: between Letti and Timor, 680 fms.

Ophiosteira Bell, 1902. Nat. hist. Southern Cross, p. 217.

1380. Type-species: OPHIOSTEIRA ANTARCTICA Bell, 1902. *op. cit.*, p. 218, pl. 26, 27. Monotypic when established. Antarctica: Cape Adare, 20–26 fms.
1381. O. SENOUQUI Koehler, 1912. Charcot exp. Ech., p. 110, pl. 10, f. 8–11. Antarctica: Marguerite Bay, 110–142 fms.

Ophiophycis Koehler, 1901. Bull. Soc. zool. France, **26**, p. 222.

1382. Type-species: OPHIOPHYCIS MIRABILIS Koehler, 1901. *loc. cit.*, f. 1, 2. Monotypic. Near the Azores, 648 fms.

Ophiotjalfa Mortensen, 1913. Vid. med., **66**, p. 40.

1383. Type-species: OPHIOTJALFA VIVIPARA Mortensen, 1913. *loc. cit.*, f. 4–6. Monotypic. West coast of Greenland.

[1] Without definite locality.

ASPIDOPHIURA Matsumoto, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 76.

1384. Type-species: ASPIDOPHIURA WATASEI MATSUMOTO, 1915. *op. cit.*, p. 77. Type designated. Japan: Sagami Sea; Uraga Channel.

1385. A. FORBESI (DUNCAN), 1879. Journ. Linn. soc. Zool., **14**, p. 449, pl. 9, f. 1–3 (*Ophioglypha*). Korean Strait, 51 fms.

1386. A. MINUTA (LYMAN), 1878. Bull. M. C. Z., **5**, p. 94, pl. 5, f. 117–119 (*Ophioglypha*). Antarctic Ocean, south of Australia, 1800 fms.

ASTROPHIURA Sladen, 1879. Zool. anz., **2**, p. 10.

1387. Type-species: ASTROPHIURA PERMIRA SLADEN, 1879. *loc. cit.* Ann. mag. nat. hist., ser. 5, **4**, p. 401, pl. 20, f. 1–10. Monotypic when established. Madagascar.

1388. A. KAWAMURAI MATSUMOTO, 1913. Ann. zool. Japon., **8**, p. 225, pl. 3. Japan: Sagami Sea, 330 fms.

OPHIOLEUCIDAE.

OPHIOLEUCE.

KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 32.

Type-species: *Ophioleuce seminudum* KOEHLER, 1904. *op. cit.*, p. 33. Type here first definitely designated.

1389. O. BREVISPINA (H. L. CLARK).

Ophiocten brevispinum H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 98, f. 36.
Ophioleuce brevispinum MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 83.

1 PARATYPE. EASTERN SEA, 361 fms.

1390. O. CHARISCHEMA (H. L. CLARK).

Ophiocten charischema H. L. CLARK, 1911. Bull. 75 U. S. N. M., p. 97, f. 35.
Ophioleuce charischema MATSUMOTO, 1915. Proc. Acad. nat. sci. Phil., **67**, p. 83.

5 PARATYPES. Japan: KAGOSHIMA GULF, 152 fms.; southwest of Goto Islands, 139 fms.

1391. O. DEPRESSA (LYMAN).

Ophiocten depressum LYMAN, 1869. Bull. M. C. Z., **1**, p. 320. 1871. Illus. cat. M. C. Z., no. 6, pl. 2, f. 10.
Ophioleuce depressum KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 33.

HOLOTYPE and 1 PARATYPE. Bahamas: off Double-headed Shot Key, 315 fms.

Species of Ophioleuce not represented in the M. C. Z.

1392. O. SEMINUDA KOEHLER, 1904. Siboga-exp. Oph. mer prof., p. 33, pl. 2, f. 7–10. Dutch East Indies: north of Ceram, 908 fms.

Ophiopaepale.

Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 615.

Type-species: *Ophiopaepale goësiana* Ljungman, 1871. *loc. cit.* Monotypic.

1393. O. GOËSIANA Ljungman, 1871. Öfv. Kongl. Vet.-akad. Förh., **28**, p. 615. Koehler, 1904. Mem. Soc. zool. France, **17**, p. 57, f. 1–4.

19 specimens. Gulf of Mexico: northwest of the Tortugas, 101 fms. Cuba: off Havana, 80–250 fms. Off St. Cruz, D. W. I., 38–115 fms. Off Montserrat, 88 fms. Off St. Vincent, 124 fms. Off Grenada, 92 fms. Off Barbados, 76–123 fms.

Ophiocirce.

Koehler, 1904. Siboga-exp. Oph. mer prof., p. 13.

Type-species: *Ophiocirce inutilis* Koehler, 1904. *loc. cit.* Monotypic.

1394. O. INUTILIS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 13, pl. 3, f. 4, 5.

1 cotype. Dutch East Indies: south of Timor, 63 fms.

Ophiopyren.

Lyman, 1878. Bull. M. C. Z., **5**, p. 133.

Type-species: *Ophiopyren longispinus* Lyman, 1878. *op. cit.*, p. 134. Type here first definitely designated.

1395. O. LONGISPINUS Lyman, 1878. Bull. M. C. Z., **5**, p. 134, pl. 7, f. 176–178.

88 specimens. Yucatan: north of Alacran Reef, 84 fms.; off Chincorro Bank, 600 fms. Off St. Thomas, D. W. I., 450 fms. Off St. Cruz, D. W. I., 451–625 fms. Off St. Kitts, 60–180 fms. Off Nevis, 375 fms. Off Dominica, 333–372 fms. Off Martinique, 317–476 fms. Off St. Lucia, 422–423 fms. Off St. Vincent, 464 fms. Off Grenada, 154–291 fms.

Species of Ophiopyren not represented in the M. C. Z.

1396. O. BISPINOSUS Koehler, 1897. Ann. sci. nat. Zool., ser. 8, **4**, p. 312, pl. 6, f. 26, 27. Andaman Islands, 240–250 fms.

1397. O. BREVISPINUS Lyman, 1878. Bull. M. C. Z., **5**, p. 133, pl. 7, f. 173–175. Fiji: off Matuka Bay, 300 fms.

1398. O. DELATUS Koehler, 1904. Siboga-exp. Oph. mer prof., p. 10, pl. 3, f. 6, 7. Dutch East Indies: north of Lombok, 300 fms.

1399. O. REGULARIS Koehler, 1900. Bull. Acad. Belgique, p. 819. 1901. Belgica Ech. et Oph., p. 26, pl. 8, f. 52–54. West Antarctica, 55–200 fms.

Ophiotrochus.

Lyman, 1878. Bull. M. C. Z., **5**, p. 129.

Type-species: *Ophiotrochus panniculus* Lyman, 1878. *loc. cit.* Monotypic when established.

1400. O. PANNICULUS Lyman, 1878. Bull. M. C. Z., **5**. p. 129, pl. 6, f. 158–160.

1 cotype. Between New Guinea and the Admiralty Islands, 1070 fms.

Species of Ophiotrochus not represented in the M. C. Z.

1401. O. LONGISPINUS H. L. Clark, 1911. Bull. 75 U. S. N. M., p. 94, f. 33. Japan: Sagami Sea, 918 fms.

Ophiernus.

Lyman, 1878. Bull. M. C. Z., **5**, p. 122.

Type-species: *Ophiernus vallincola* Lyman, 1878. *loc. cit.* Monotypic when established.

1402. O. ADSPERSUM Lyman, 1883. Bull. M. C. Z., **10**, p. 236, pl. 3, f. 19–21.

73 specimens, including holotype and 69 paratypes. Off Jamaica, 322–555 fms. Off St. Cruz, D. W. I., 314–451 fms. Off St. Kitts, 208 fms. Off Nevis, 375 fms. Off Guadeloupe, 583 fms. Off Dominica, 333–524 fms. Off Martinique, 1030 fms. Off St. Lucia, 422 fms. Off St. Vincent, 424–464 fms. Off Grenadines, 338 fms. Off Grenada, 159–416 fms. Off Barbados, 200–399 fms. Japan: off Shio Misaki Light, 244–290 fms.; in Colnett Strait, 1008 fms. Ceylon: off Colombo, 480 fms.

1403. O. ANNECTENS Lütken and Mortensen, 1899. Mem. M. C. Z., **23** p. 107, pl. 5, f. 4–6.

6 cotypes. Off Galapagos Islands, 421 fms.

1404. O. POLYPORUM Lütken and Mortensen, 1899. Mem. M. C. Z. **23**, p. 109, pl. 5, f. 7–9.

6 specimens, including 3 cotypes. Lower California: off Cape St. Lucas, 491 fms. Mexico: off Las Tres Marias Islands, 680 fms.

1405. O. SEMINUDUM Lütken and Mortensen, 1899. Mem. M. C. Z., **23**, p. 105, pl. 5, f. 10–12

8 cotypes. Mexico: southeast from Tehuantepec, 2232 fms. Off Ecuador, 1573 fms.

1406. O. VALLINCOLA Lyman, 1878. Bull. M. C. Z., **5**, p. 122, pl. 6, f. 170–172.

5 cotypes. West of Crozet Islands, 1375 fms.

Species of Ophiernus not represented in the M. C. Z.

1407. O. ABYSSALE Koehler, 1896. Mem. Soc. zool. France, **9**, p. 242. 1909. Princesse-Alice Echinod., pl. 28, f. 3, 4. Eastern North Atlantic Ocean, 930–1094 fms.

1408. O. QUADRISPINUM Koehler, 1907. Zool. anz., **32**, p. 146. 1908. Trans. Roy. soc. Edinburgh, **46**, p. 601, pl. 11, f. 102, 103. Antarctic Ocean, 1775 fms.

Genera of Ophioleucidae not represented in the M. C. Z.

Ophiocrates Koehler, 1904. Siboga-exp. Oph. mer prof., p. 19.

1409. Type-species: OPHIOCRATES LENTA Koehler, 1904. *loc. cit.*, pl. 6, f. 7, 8. Monotypic when established. Dutch East Indies: Strait of Macassar, 1128 fms.

1410. O. SECUNDA Koehler, 1906. Mem. Soc. zool. France, **19**, p. 14, pl. 1, f. 13, 14. West Africa: off Rio de Oro, 1292–1466 fms.

Ophiopallas Koehler, 1904. Siboga-exp. Oph. mer prof., p. 12.

1411. Type-species: OPHIOPALLAS PARADOXA Koehler, 1904. *loc. cit.*, pl. 3, f. 1–3. Monotypic. Dutch East Indies: three widely separated stations, 113–250 fms.

Ophioperla Koehler, 1912. Charcot exp. Ech., p. 125.

1412. Type-species: OPHIOPERLA LUDWIGI Koehler, 1912. *op. cit.*, p. 126, pl. 10, f. 1, 5–7. Monotypic. Antarctica: Roosen Channel, 39 fms.; near King George Island, 42 fms.

Index of Generic Names.

The following index is intended to list every generic or subgeneric name which has been used for Recent ophiurans. Typographical errors, even of the obvious kind, are included to avoid possible inconvenience. Synonyms are in italics. The original spelling of each name is the form accepted, excepting Trichaster where the correct and generally used form is retained. The sign = is used as indicating not only "equivalent to," but also, "included in" or "not clearly separable from." The numbers refer to pages.

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Index of Specific Names.

The following index is intended to list every specific name which has been used for a Recent ophiuran. The names of authors are as a rule omitted but each specific name is followed by that of the genus in which the species belongs. When a species has been referred to more than one genus, the generic names are arranged in alphabetical order. Synonyms, *nomina nuda*, etc. are in italics. Typographical errors and slips of the pen are surprisingly common in transcribing ophiuran names, even in our standard works of reference. Since such mistakes are often misleading they are included in this index, except in the following cases: substitutions of *ter* for *tr*, *oe* for *ae*, *th* for *t* and *i* for *y*, and *vice versa*. In these, and all other cases, the original spelling is accepted, unless there is some very strong reason for not doing so. As regards the terminal syllable of the name, the attempt is made to have adjective names agree with the generic name in gender. There has been so much carelessness in this matter that many specific names occur in *us*, *a* or *um*, and in *e* or *is*, more or less indiscriminately, but only the correct form is listed in this index, quite regardless of the original spelling. As for specific names, formed from personal names and ending in *i* or *ii* the original spelling is adhered to, but no distinction is made between the two forms, in this index. The numbers refer to *the number of the species*.

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Stegophiura 1187
vorax, Ophiacantha 342

wahlbergii, Ophioderma 1063
Ophiura 1063
waitei, Astrotoma 116
wallichii, Hemipholis ? Not identifiable.
watasei, Aspidophiura 1384
weberi, Ophiomytis 448
wendtii, Ophiocoma 1012
wundermani typ. er. (wurdemani)
wurdemanii, Amphiura 580
Ophiophragmus 580
wyville thomsoni, Ophiopyrgus 1122

xantusii, Ophionereis 977

yoldii, Ophiopeza 1073
Ophiopsammus 1073
Pectinura 1073

zouchi typ. er. (rouchi)

PLATE 1.

PLATE 1.

Ophiomyxa australis Lütken. Port Jackson, N. S. W.

Fig. 1. Aboral view. × 1.5.
2. Oral view.

Ophiomyxa brevirima H. L. Clark. Otago Harbor, N. Z.

3. Aboral view. × 2.
4. Oral view.

Ophiacantha lasia H. L. Clark. Uraga Channel, Japan.

5. Aboral view. × 3.75.

Ophiacantha macroplaca H. L. Clark. Hilo, Hawaii.

6. Aboral view. × 8.
7. Oral view.

Ophiocreas papillatum H. L. Clark. Sea of Idzu, Japan.

8. Aboral view. × 1 +.

Ophiocreas melambaphes H. L. Clark. Off Jurien Bay, West Australia.

9. Aboral view. × 3.

Asteroschema sulcatum Ljungman. West Indies?

10. Aboral view. × 3.

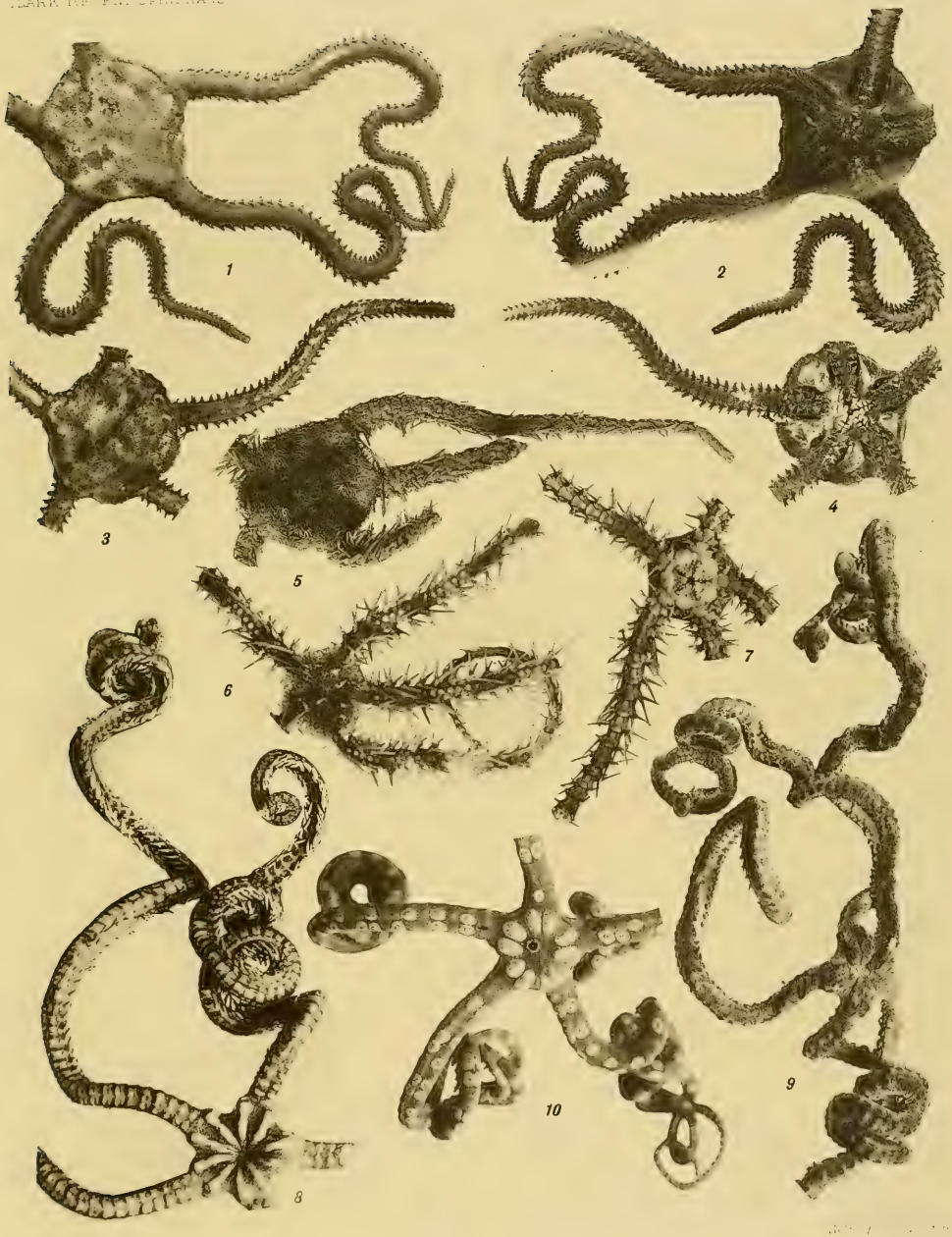
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PLATE 2.

PLATE 2.

Ophiomyxa vivipara Studer. Near Strait of Magellan, 55 fms.

Fig. 1. Aboral view. × 3.
2. Oral view.

Ophioscolex disacanthus H. L. Clark. Off western Cuba, 190 fms.

3. Aboral view. × 2.3.
4. Oral view.

Asteroschema tenue Lyman. Off Barbados, 100 fms.

5. Aboral view. × 5.

Astrochele lymani Verrill. Off Nantucket, Mass.

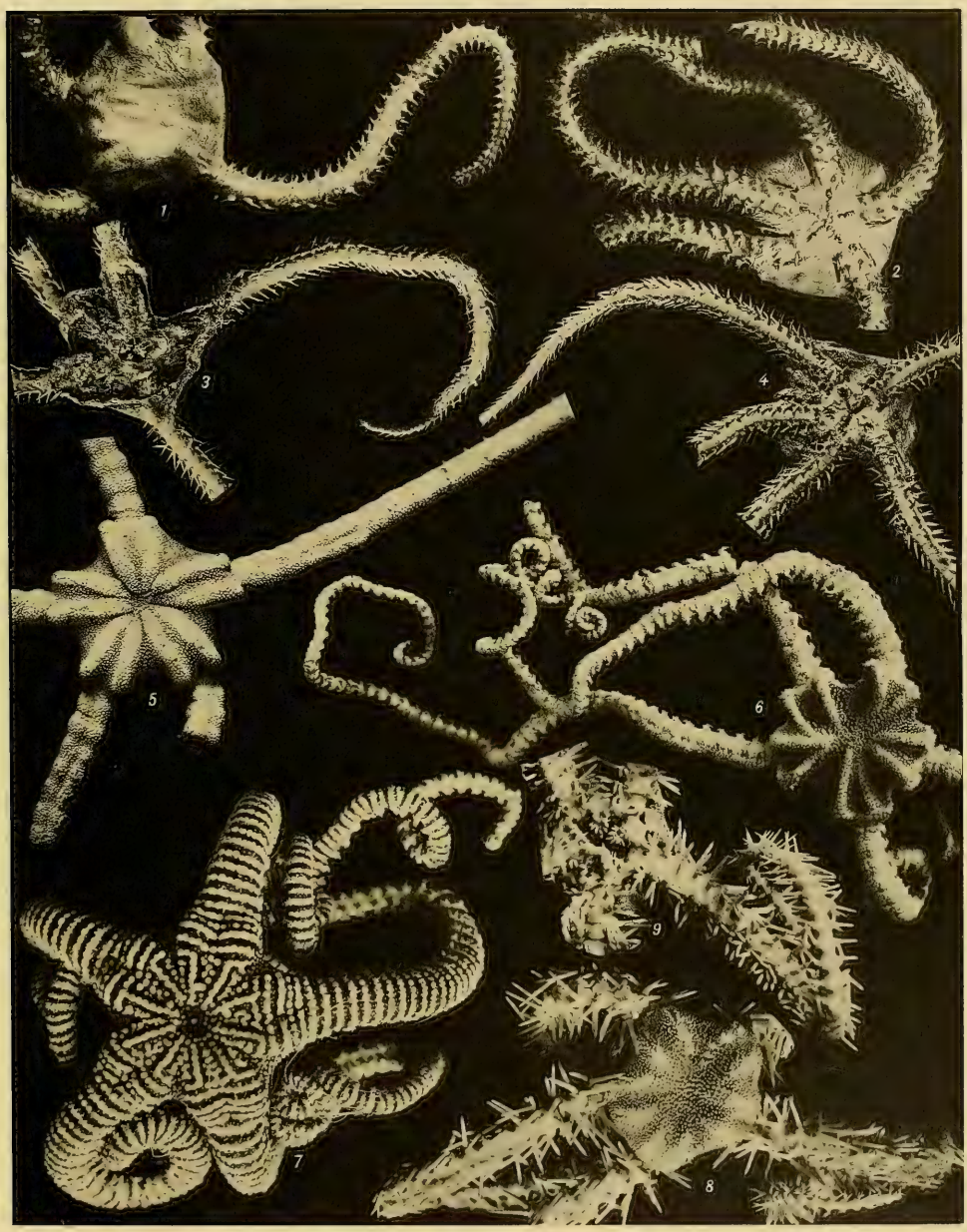
6. Aboral view. × 3.

Asteroporpa pulchra H. L. Clark. Off Barbados, 56 fms.

7. Aboral view. × 5.

Ophiolebes pachyphylax H. L. Clark. East of Nantucket, Mass., 524 fms.

8. Aboral view. × 4.
9. Oral view.



George Nelson phot. Lith. of the Court Ed.

PLATE 3.

PLATE 3.

Ophiacantha curima H. L. Clark. Off the Tortugas, Florida, 860 fms.

Fig. 1. Aboral view. × 6.
2. Oral view.

Ophiacantha fraterna Verrill. Southeast of Nantucket, Mass., 1234 fms.

3. Aboral view. × 5.
4. Oral view.

Ophiacantha millespina Verrill. Off Newport, R. I., 192 fms.

5. Aboral view. × 4.
6. Oral view.

Ophioprium imperfectum H. L. Clark. Off St. Vincent, B. W. I., 424 fms.

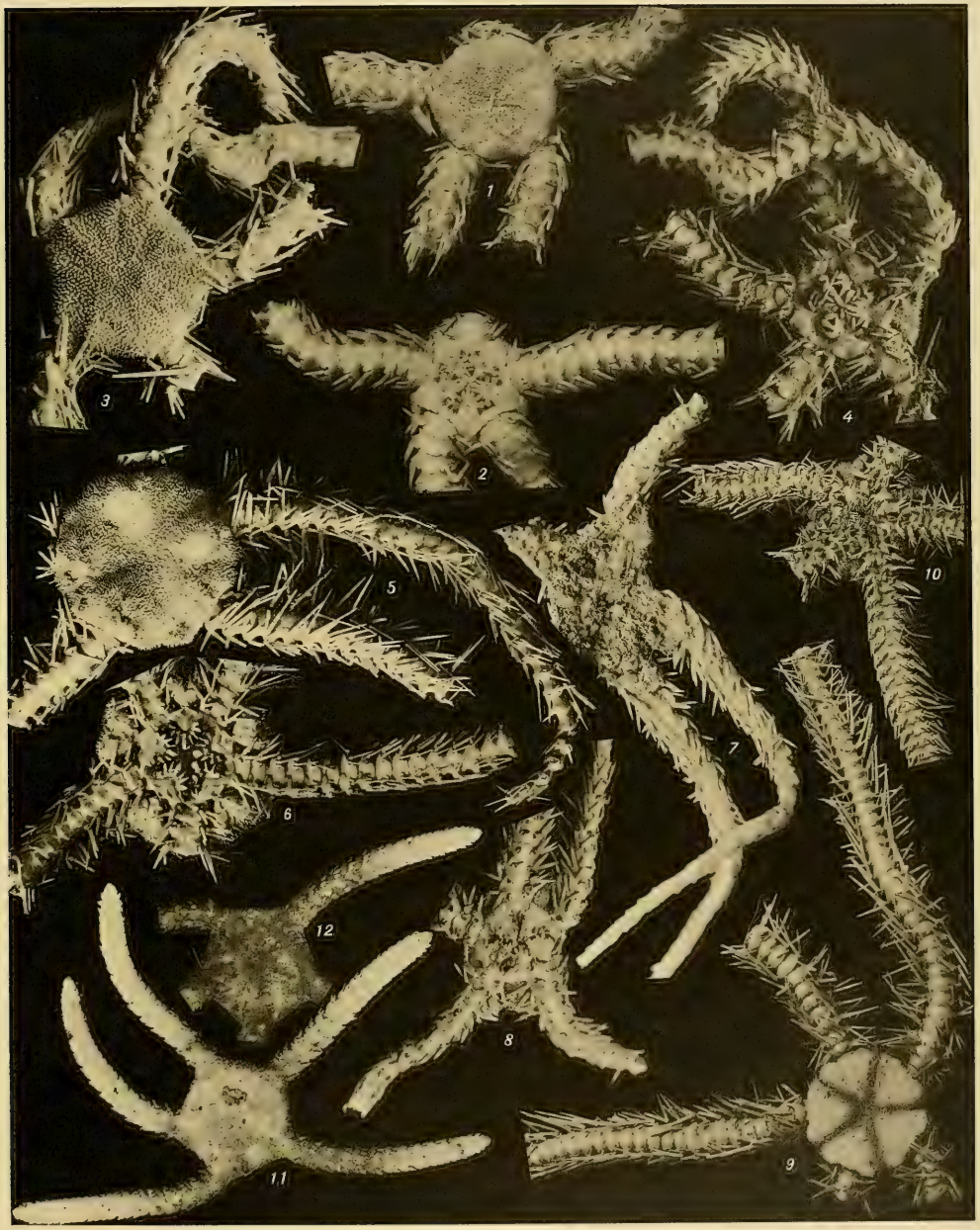
7. Aboral view. × 6.
8. Oral view.

Ophiocamax plesiotaxis H. L. Clark. Off the Andaman Islands, 220–240 fms.

9. Aboral view. × 1.66.
10. Oral view.

Ophiocormus notabilis H. L. Clark. Wellington, N. Z.

11. Aboral view. × 8.
12. Oral view.



Mem. Mus. Comp. Zool.

Heliotype Co., Boston

PLATE 4.

PLATE 4.

AMPHIURA ANTARCTICA Studer. Kerguelen.

Fig. 1. Aboral view. × 2.5.
2. Oral view.

AMPHIURA BOREALIS (G. O. Sars). Scandinavia.

3. Aboral view. × 6.
4. Oral view.

AMPHIURA MEDITERRANEA Lyman. Nice, France.

5. Aboral view. × 5.
6. Oral view.

AMPHIURA GONIODES H. L. Clark. Off Barbados, 399 fms.

7. Aboral view. × 6.
8. Oral view.

AMPHIURA EUGÉNIAE Ljungman. Off eastern Patagonia, 55 fms.

9. Aboral view. × 3.
10. Oral view.

AMPHIURA LEPTOPHOLIDA H. L. Clark. Tokyo Bay, Japan.

11. Aboral view. × 5.
12. Oral view.

AMPHIURA SEPTEMSPINOSA H. L. Clark. Mer, Murray Islands, Australia.

13. Aboral view. × 7.
14. Oral view.

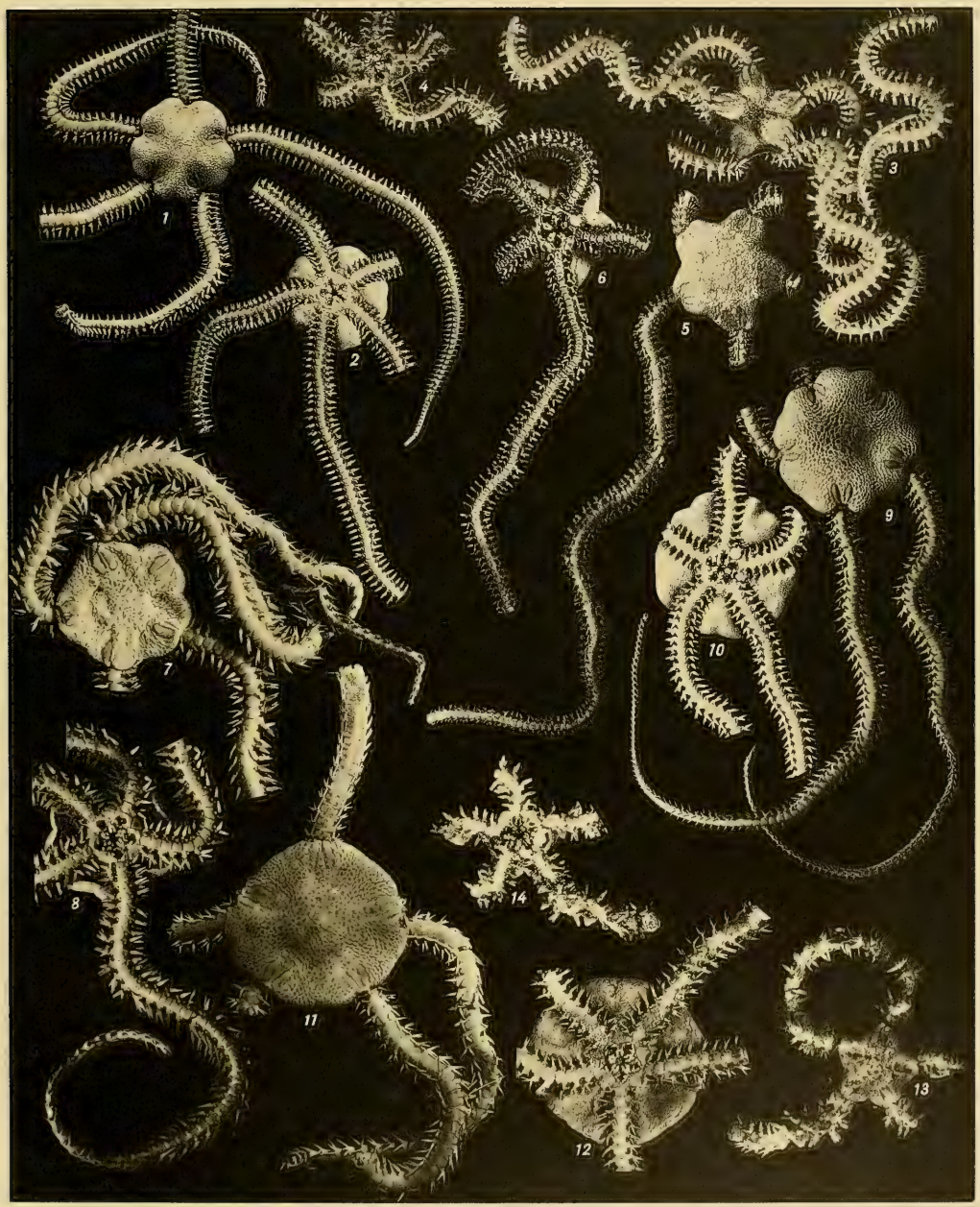


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PLATE 5.

PLATE 5.

AMPHIURA LEPTOTATA H. L. Clark. Philippine Islands.

Fig. 1. Aboral view. × 6.
2. Oral view.

AMPHIURA MULTISPINA H. L. Clark. Tokyo Bay, Japan.

3. Aboral view. × 3.
4. Oral view.

AMPHIURA MICROSOMA H. L. Clark. Mer, Murray Islands, Australia.

5. Aboral view. × 4.
6. Oral view.
7. Side view of six arm segments. × 10.

AMPHIURA SARSI Ljungman. San Miguel, Azores, 320–600 fms.

8. Aboral view. × 7.
9. Oral view.

AMPHIURA PARVA Hutton. New Zealand.

10. Aboral view. × 5.
11. Oral view.

AMPHIURA POECILA H. L. Clark. Westernport, Victoria.

12. Aboral view. × 5.
13. Oral view.

AMPHIURA SYNTARACHA H. L. Clark. Tokyo Bay, Japan.

14. Aboral view. × 3.5.
15. Oral view.

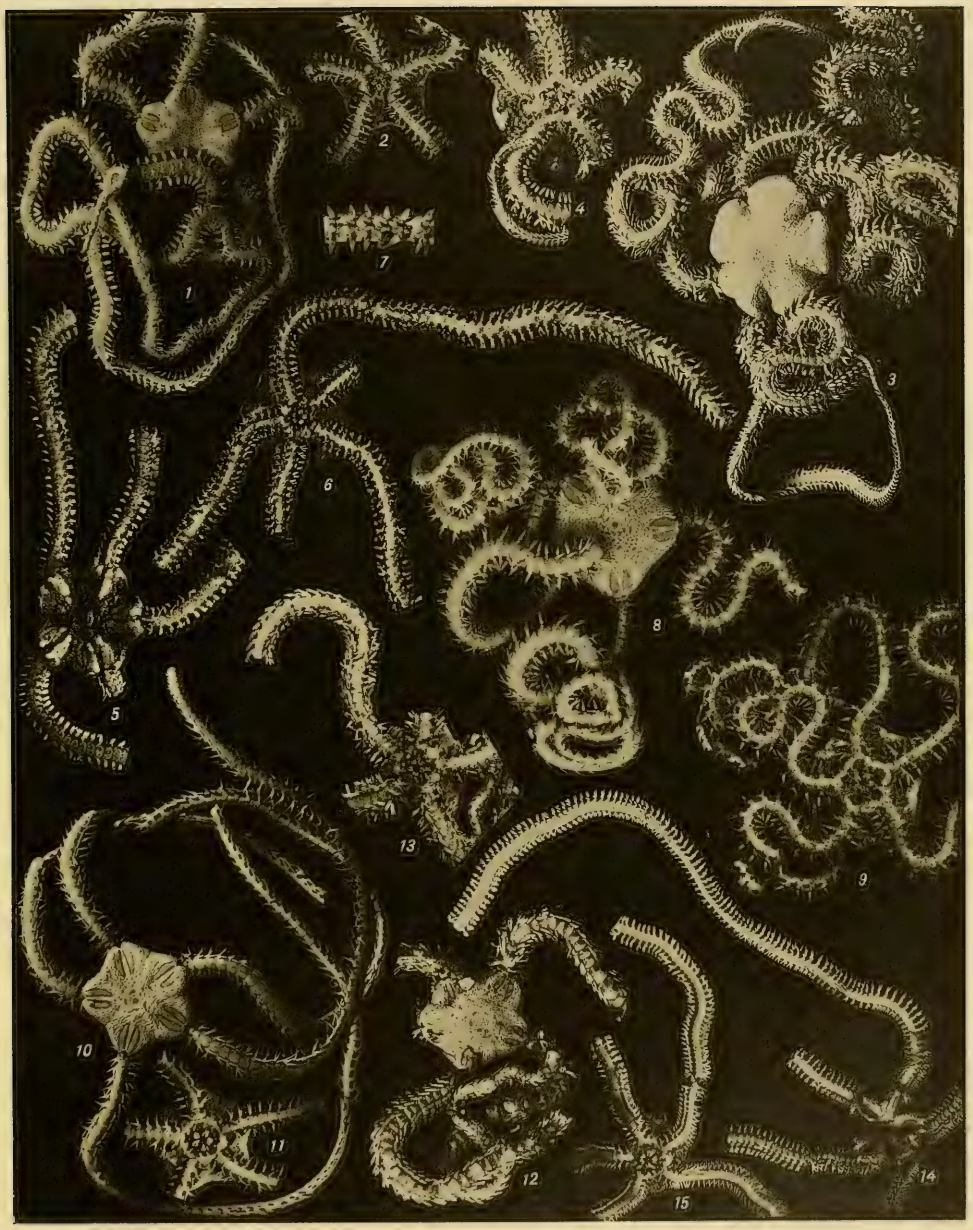
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PLATE 6.

PLATE 6.

AMPHIPHOLIS PENTACANTHA H. L. Clark. Off St. Lucia, B. W. I., 226 fms.

Fig. 1. Aboral view. × 5.
2. Oral view.

AMPHIPHOLIS LAEVIDISCA H. L. Clark. Talcahuano, Chile.

3. Aboral view. × 7.
4. Oral view.

AMPHIPHOLIS GRACILLIMA (Stimpson). Charleston, S. C.

5. Aboral view. × 2.5.
6. Oral view.

AMPHIPHOLIS GEMINATA (Leconte). Panama.

7. Aboral view. × 5.
8. Oral view.

AMPHIPHOLIS KINBERGI Ljungman. Cape of Good Hope.

9. Aboral view. × 7.
10. Oral view.

AMPHIODIA MESOPOMA H. L. Clark. Badu Island, Torres Strait.

11. Aboral view of disk. × 4.
12. Aboral view of arm.
13. Oral view of disk.
14. Oral view of arm.

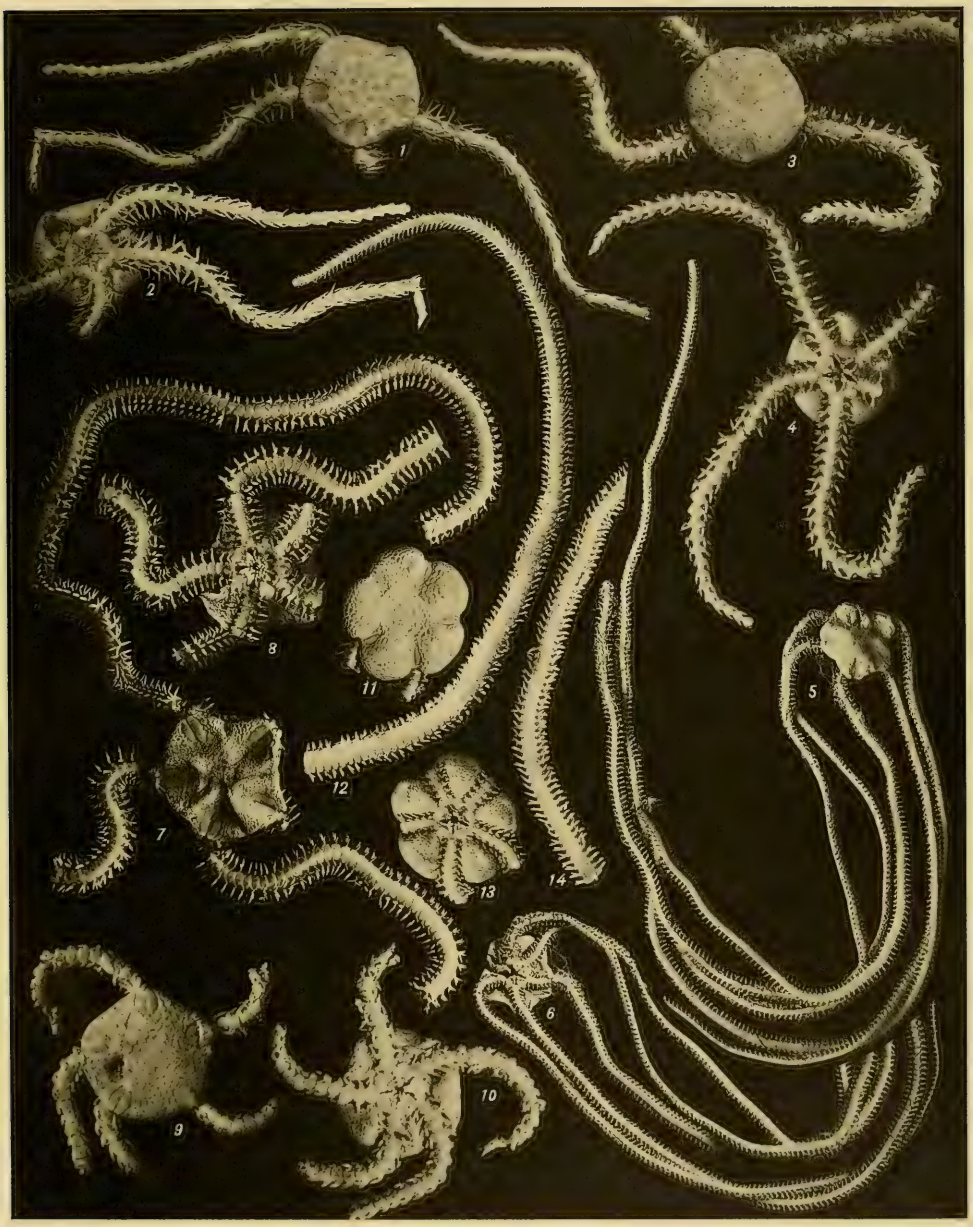
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PLATE 7.

PLATE 7.

AMPHIODIA GYRASPIS H. L. Clark. Mayaguez, Porto Rico.

Fig. 1. Aboral view without disk. × 2.5.
2. Aboral view of disk. × 5.
3. Oral view without disk. × 2.5.
4. Side view of eight arm-segments. × 10.

AMPHIOPLUS PARVICLYPEUS H. L. Clark. Badu Island, Torres Strait.

5. Aboral view of disk. × 4.
6. Aboral view of mouth-frame and arm.
7. Oral view of disk-cap.
8. Oral view of mouth-frame and arm.

AMPHIOPLUS ASTERICTUS H. L. Clark. Tokyo Bay, Japan.

9. Aboral view. × 3.5.
10. Oral view.
11. Side view of six arm-segments. × 10.

AMPHIOPLUS LOBATODES H. L. Clark. Sagami Bay, Japan.

12. Aboral view. × 3.
13. Oral view.

AMPHIOPLUS CYRTACANTHUS H. L. Clark. Philippine Islands.

14. Aboral view without disk. × 3.
15. Oral view without disk.

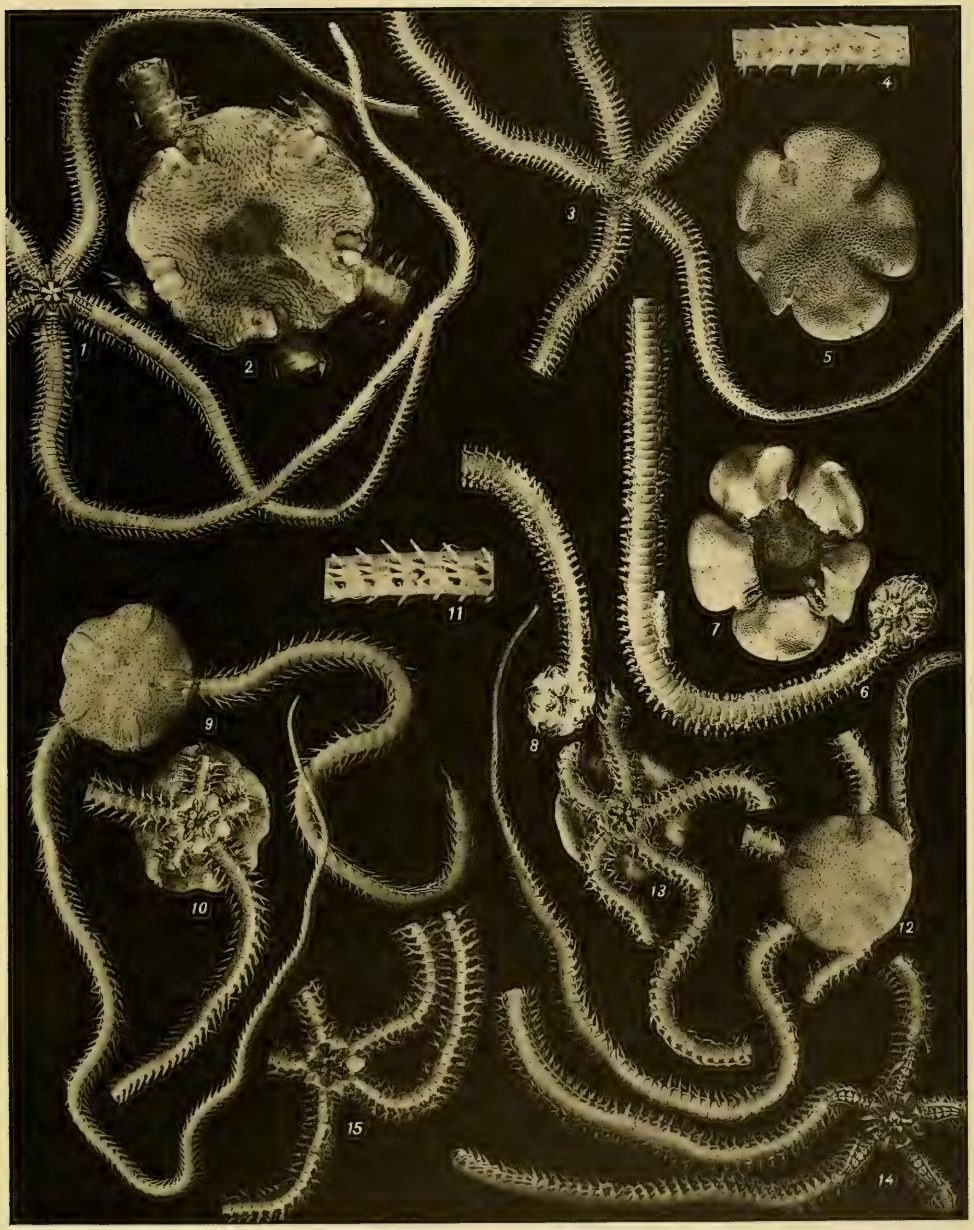
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PLATE 8.

PLATE 8.

AMPHIOPLUS MACILENTUS (Verrill). Off Marthas Vineyard, Mass., 63 fms.

Fig. 1. Aboral view. × 3.
2. Oral view.

AMPHIODIA LIMBATA (Grube). Rio Janeiro, Brazil.

3. Aboral view. × 3.
4. Oral view.

AMPHIODIA ATRA (Stimpson). Charleston, S. C.

5. Aboral view. × 4.
6. Oral view of piece of arm. × 4.
7. Side view of piece of arm. × 10.

AMPHIODIA PLANISPINA (von Martens). Rio Janeiro, Brazil.

8. Aboral view. × 5.
9. Oral view.

AMPHIOPLUS CONGENSIS (Studer). Off the mouth of the Congo.

10. Aboral view. × 5.
11. Oral view.
12. Side view of six arm-segments. × 10.

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PLATE 9.

PLATE 9.

OPHIOCNIDA HISPIDA (Leconte). Panama.

Fig. 1. Aboral view. × 2.
2. Oral view.

OPHIOCINDA SCABRIUSCULA (Lütken). West Indies.

3. Aboral view. × 3.
4. Oral view.

AMPHIOCNIDA INAEQUALIS H. L. Clark. Hong Kong.

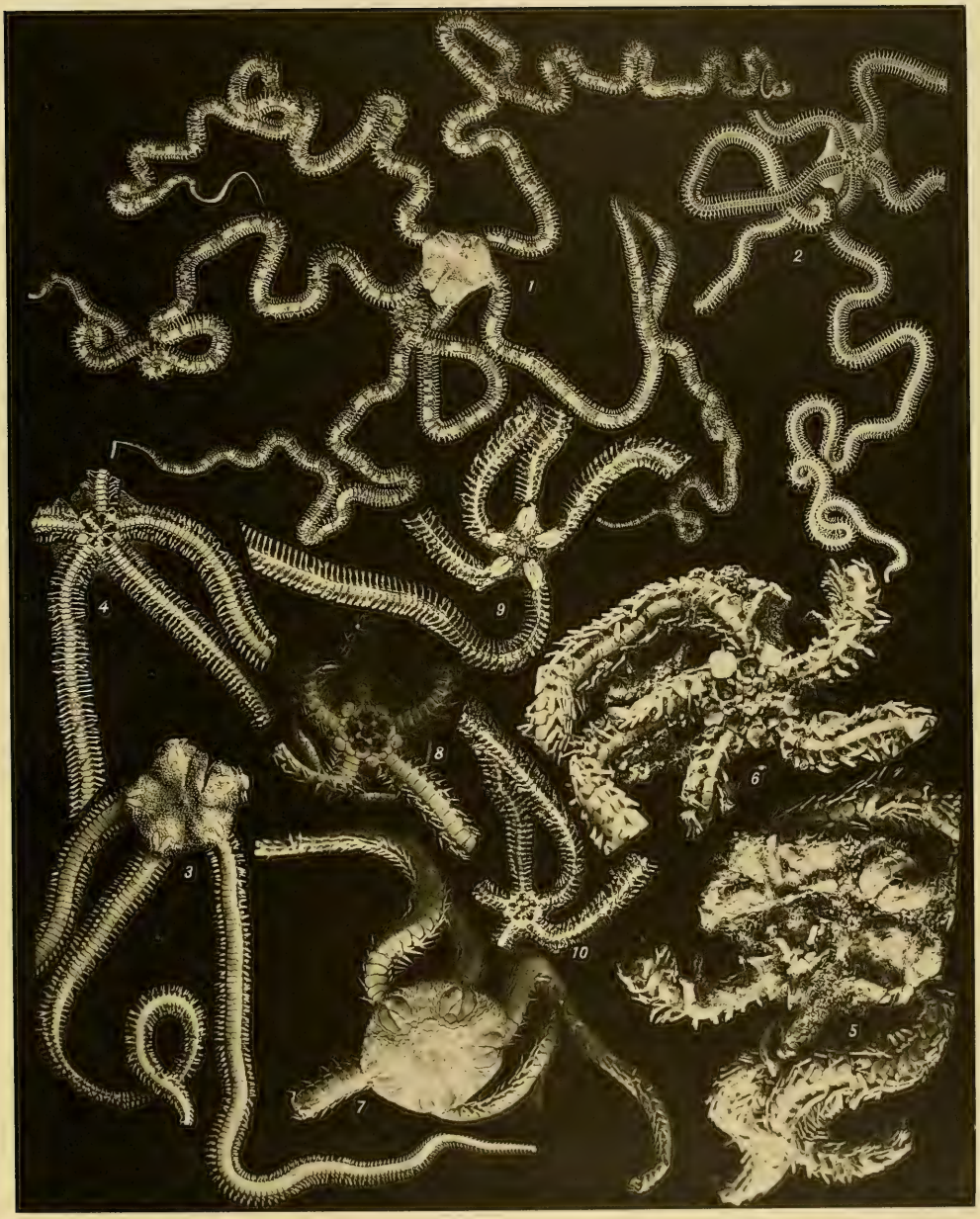
5. Aboral view. × 5.
6. Oral view.

HEMIPHOLIS GRACILIS Verrill. Pearl Islands, Panama.

7. Aboral view. × 5.
8. Oral view.

OPHIONEPHTHYS OCTACANTHA H. L. Clark. Friday Island, Torres Strait.

9. Aboral view. × 3.
10. Oral view.



Smithsonian Museum photo

Holotype of Ophiopeza

PLATE 10.

PLATE 10.

Ophiactis plana Lyman. Off Georgia, U. S. A., 225 fms.

Fig. 1. Aboral view. × 8.
2. Oral view.

Ophiactis loricata Lyman. Off Alligator Reef, Florida, 110 fms.

3. Aboral view. × 8.
4. Oral view.

Ophiactis simplex (Leconte). Magdalena Bay, Lower California.

5. Aboral view. × 7.
6. Oral view.

Ophiactis hemiteles H. L. Clark. Mer, Murray Islands, Australia.

7. Aboral view. × 5.
8. Oral view.

Ophiactis quadrispina H. L. Clark. Philippine Islands.

9. Aboral view. × 5.
10. Side view of seven arm-segments. × 10.

Ophiactis asperula (Philippi). Sandy Point, Patagonia.

11. Aboral view. × 3.
12. Oral view.

Ophiophragmus brachyactis H. L. Clark. Sombrero Key, Florida.

13. Aboral view. × 4.
14. Oral view.

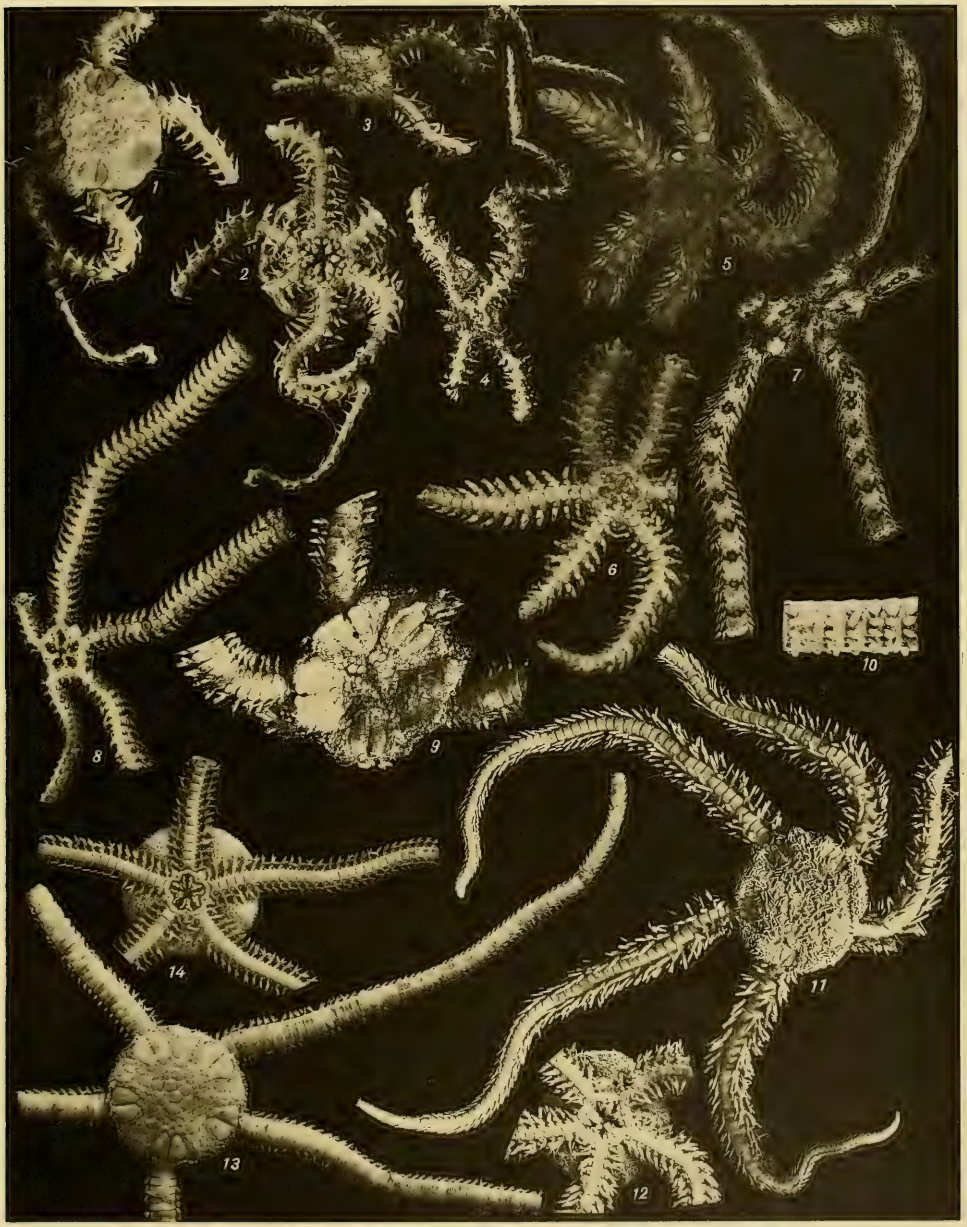

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PLATE 11.

PLATE 11.

Ophiactis nomentis Farquhar. Cape Maria van Diemen, N. Z.

Fig. 1. Aboral view. × 3.
2. Oral view.

Ophiactis maculosa von Martens. Philippine Islands.

3. Aboral view. × 5.
4. Oral view.

Ophiactis mülleri Lütken. Florida.

5. Aboral view. × 2.
6. Oral view.

Ophiactis luteomaculata H. L. Clark. Mer, Murray Islands, Australia.

7. Aboral view. × 7.
8. Oral view.

Ophiactis delicata H. L. Clark. Mer, Murray Islands, Australia.

9. Aboral view. × 7.
10. Oral view.

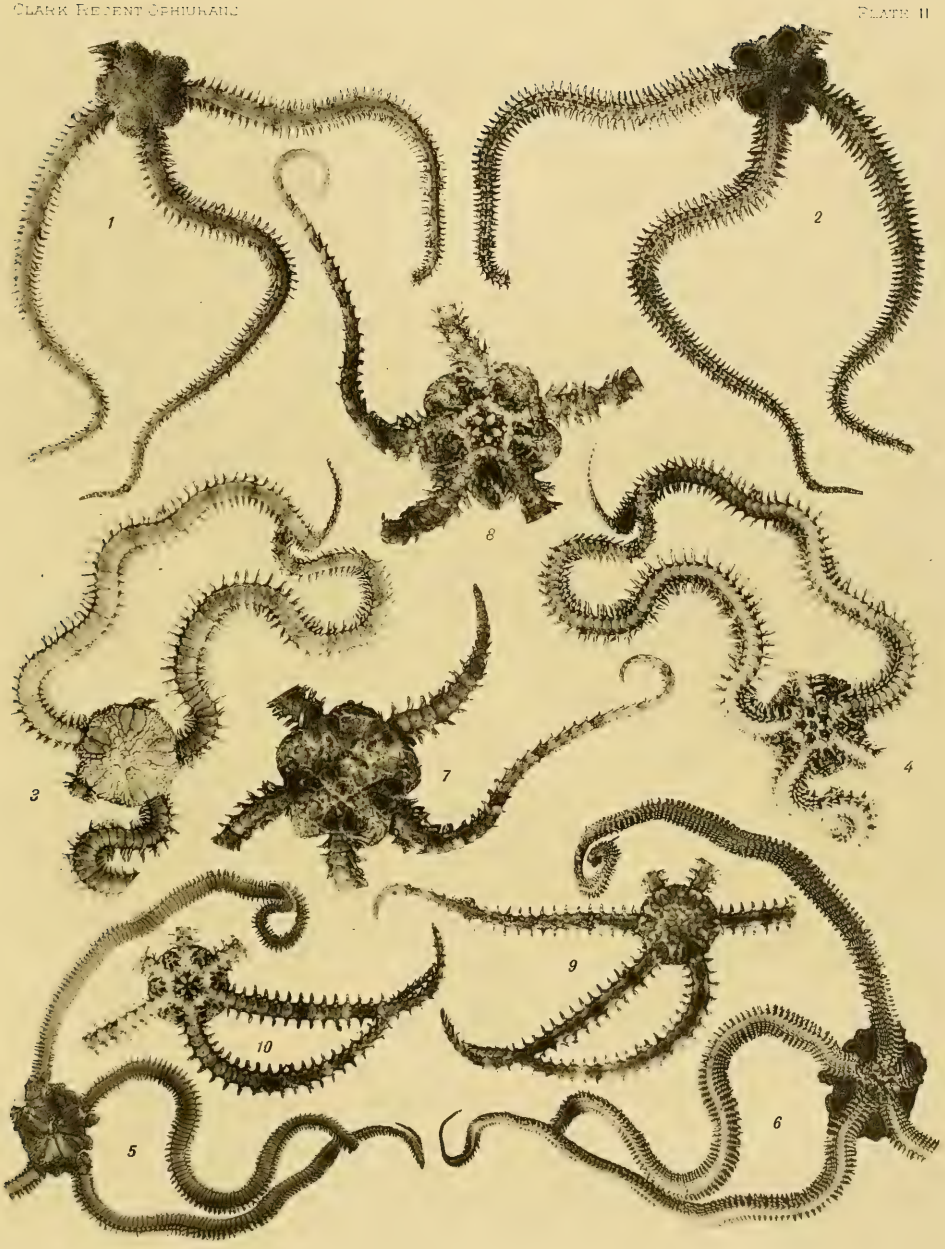

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PLATE 12.

PLATE 12.

Ophiothrix brachyactis H. L. Clark. Tortugas, Florida.

Fig. 1. Aboral view. × 6.
2. Oral view.

Ophiothrix liodisca H. L. Clark. Mer, Murray Islands, Australia.

3. Aboral view. × 3.

Ophiothrix lineata Lyman. Sand Key, Florida.

4. Aboral view. × 1.8.

Ophiothrix hybrida H. L. Clark. Fiji (or Samoa).

5. Aboral view. × 3.

Ophiothrix dumosa Lyman. Pacific Grove, Cal.

6. Aboral view. × 4.

Ophiogymna elegans Ljungman. Singapore.

7. Aboral view. × 4.
8. Oral view.

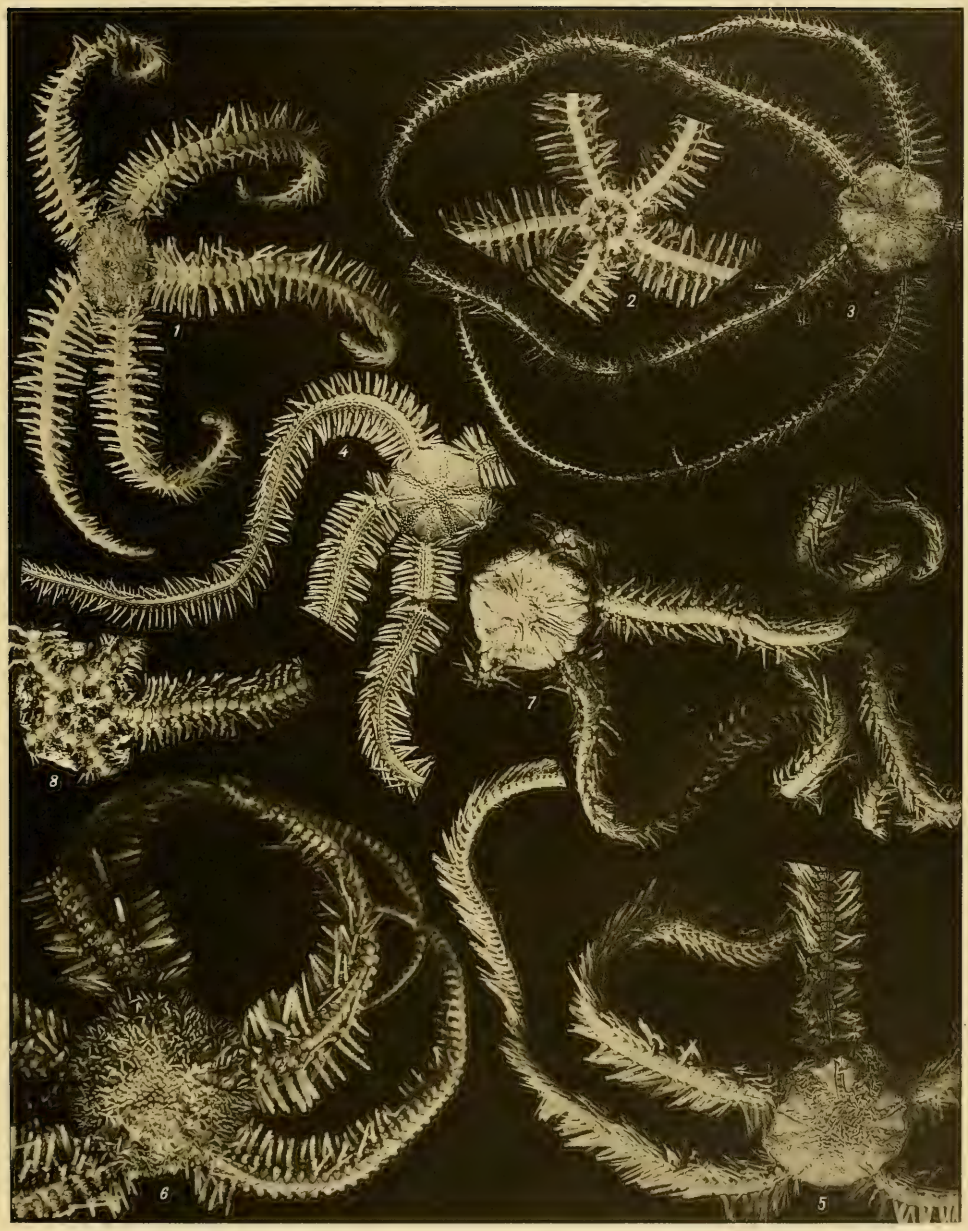
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PLATE 13.

PLATE 13.

Ophionereis schayeri (Müller and Troschel). Port Jackson, N. S. W.

Fig. 1. Aboral view. Nat. size.
2. Oral view.

Ophiothrix dyscrita H. L. Clark. Mer, Murray Islands, Australia.

3. Aboral view. × 8.

Ophiothrix rhabdota H. L. Clark. Mer, Murray Islands, Australia.

4. Aboral view. × 1+.

Ophiothrix poecilodisca H. L. Clark. Zanzibar.

5. Aboral view. × 2.

Ophiocoma aethiops Lütken. Panama.

6. Aboral view. × .8.
7. Oral view.

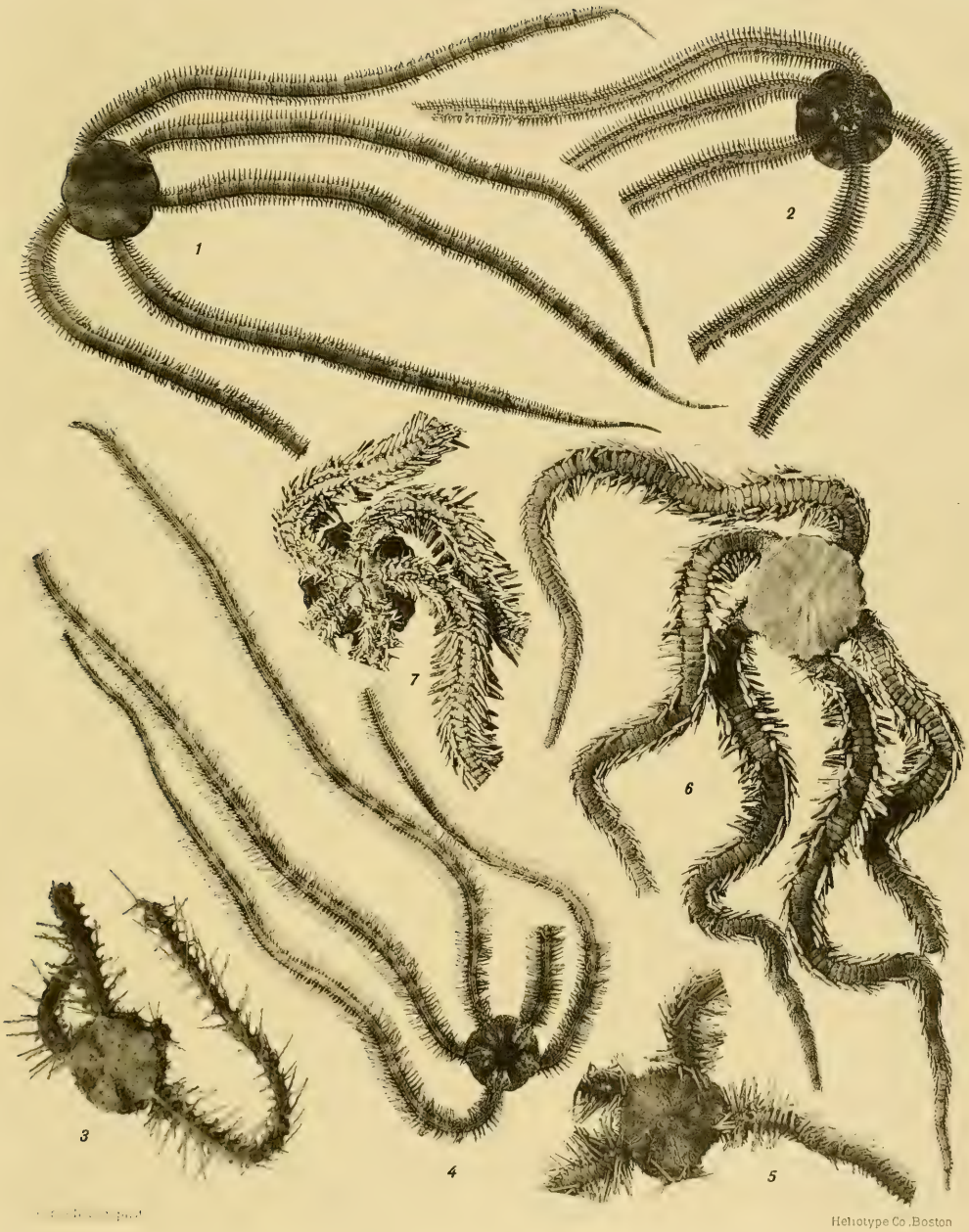

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PLATE 14.

PLATE 14.

Ophiothela caerulea H. L. Clark. Arabian Gulf.

Fig. 1. Aboral view. × 6.

Ophiothela hadra H. L. Clark. Australia.

2. Aboral view. × 6.

Ophiopsila polysticta H. L. Clark. Barbados, 7.5–50 fms.

3. Aboral view. × 3.
4. Oral view.
5. Side view of eight arm-segments. × 10.

Ophiopsila polyacantha H. L. Clark. Borneo Bank, Macassar Strait, D. E. I., 33 fms.

6. Aboral view. × 4.
7. Oral view.

Ophiocoma parva H. L. Clark. Mer, Murray Islands, Australia.

8. Aboral view. × 4.
9. Oral view.

Ophiocoma scolopendrina (Lamarck). Mer, Murray Islands, Australia.

10. Aboral view. × .8.
11. Oral view.

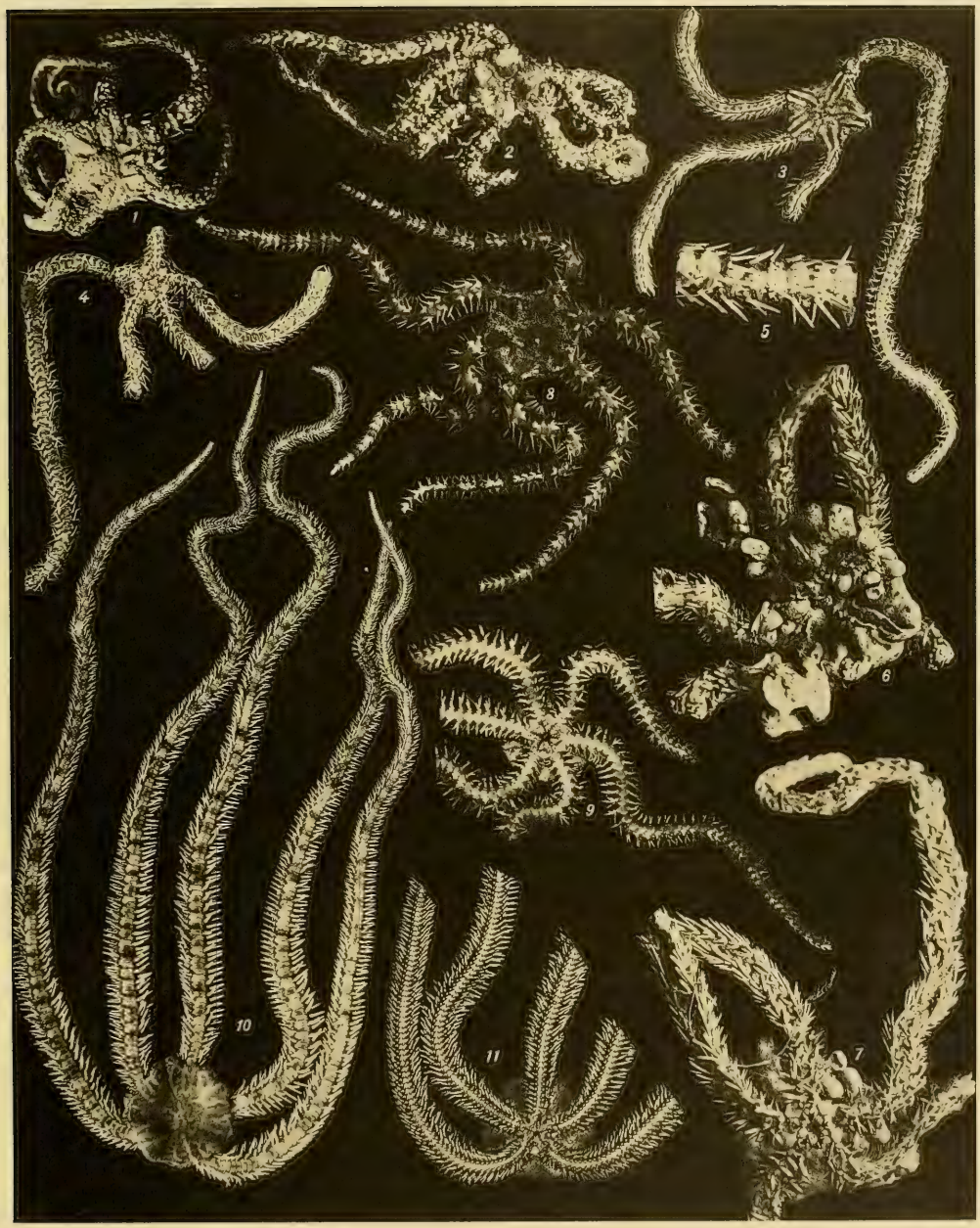
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PLATE 15.

PLATE 15.

Ophiocoma schoenleinii Müller and Troschel. Mer, Murray Islands, Australia.

Fig. 1. Aboral view. × 1.3.
2. Oral view.

Ophiocoma insularia Lyman. Maui, Hawaiian Islands.

3. Aboral view. × 2.
4. Oral view.

Ophiocoma erinacea Müller and Troschel. Mer, Murray Islands, Australia.

5. Aboral view. × 2.
6. Oral view.

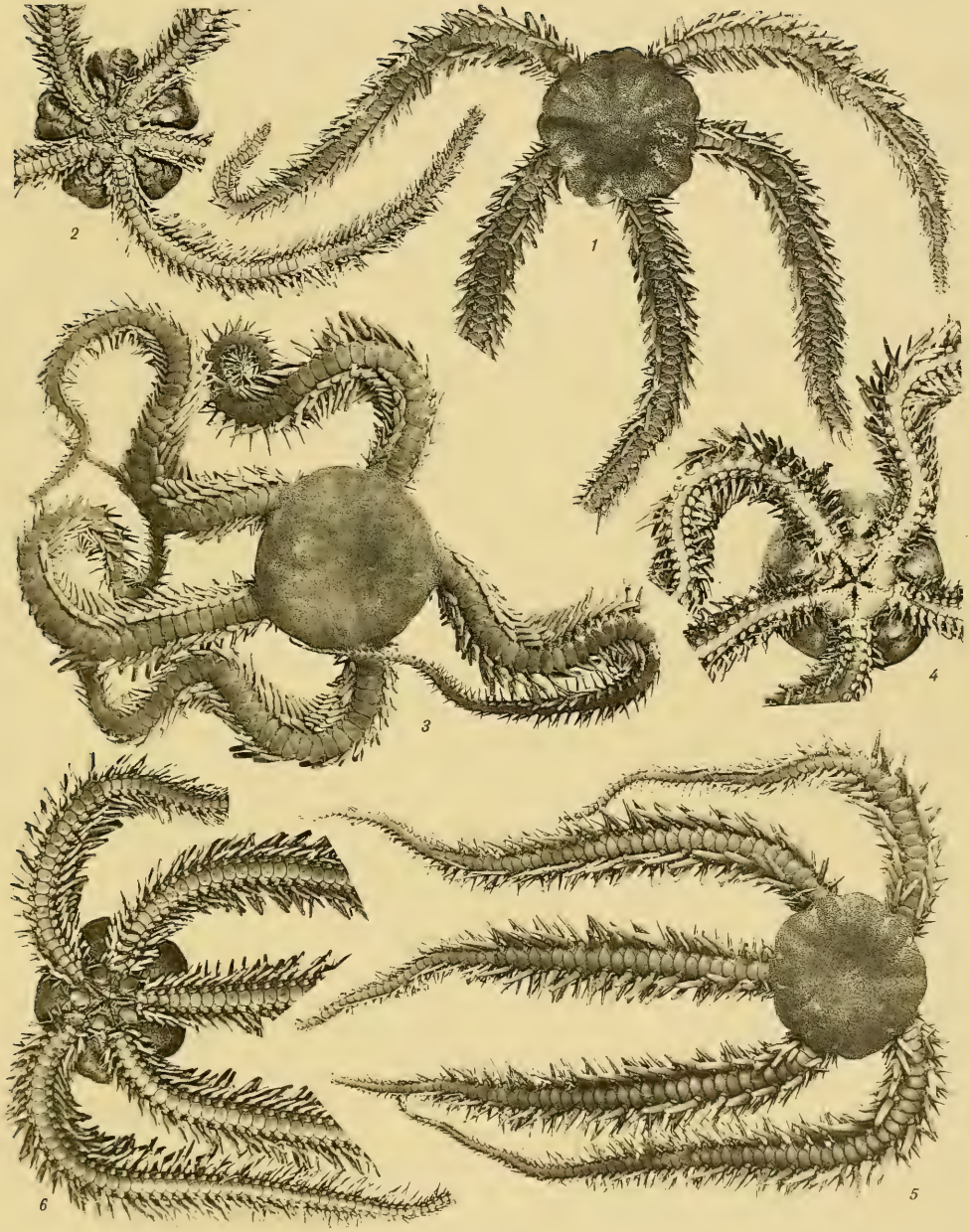
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PLATE 16.

PLATE 16.

Ophiomastix corallicola H. L. Clark. Mer, Murray Islands, Australia.

Fig. 1. Aboral view. × 1.3.
2. Oral view.

Ophiomastix lütkeni Pfeffer. Riu Kiu Islands, Japan.

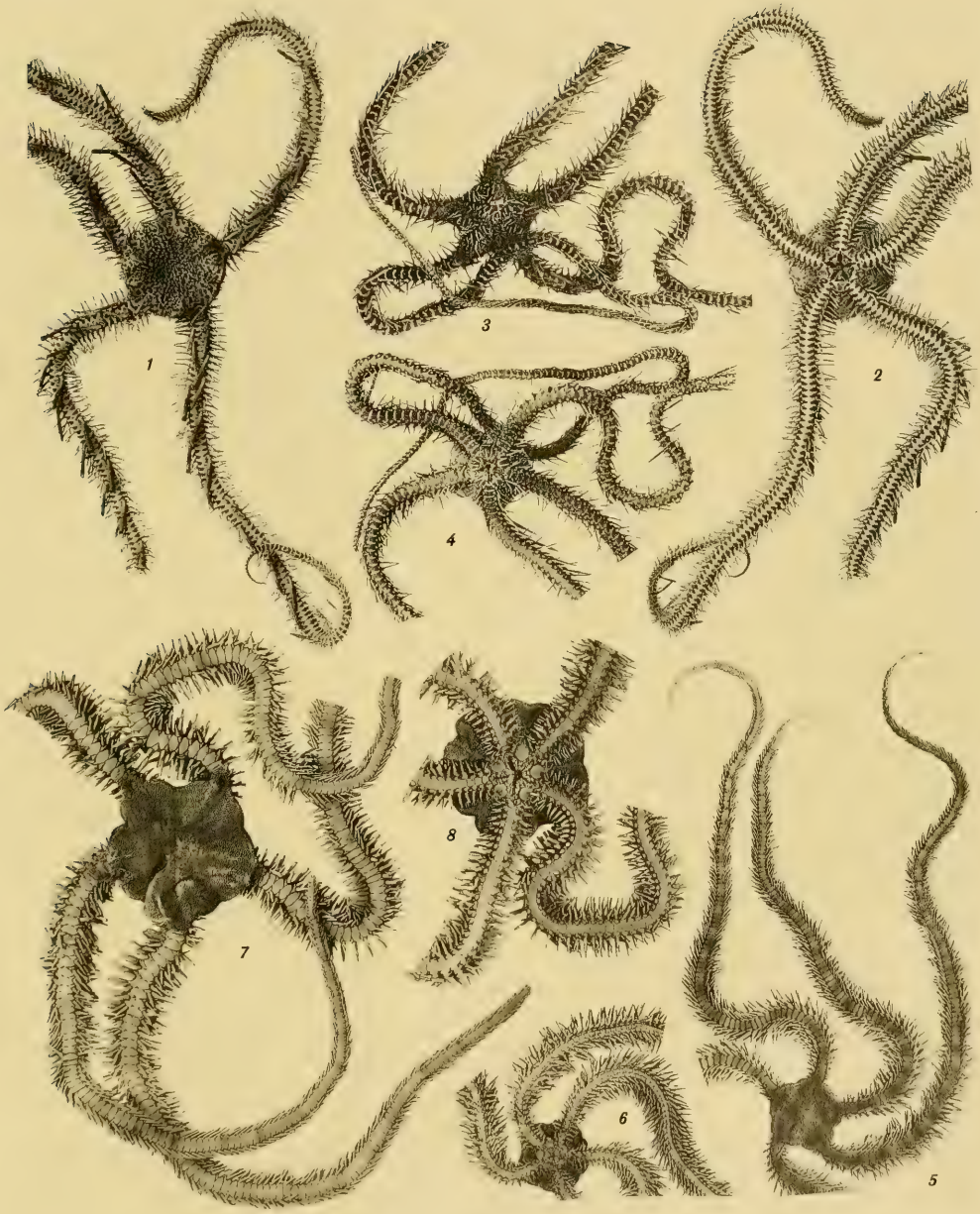
3. Aboral view. × 1.2.
4. Oral view.

Ophiocoma alexandri Lyman. Angeles Bay, Lower California.

5. Aboral view. Nat. size.
6. Oral view.

Ophiocoma valenciae Müller and Troschel. Zanzibar.

7. Aboral view. × 1.5.
8. Oral view.



George Nelson, photo Heliotype Co Boston

PLATE 17.

PLATE 17.

AMPHIOPHIURA METABULA H. L. Clark. North of Cuba, 292 fms.

Fig. 1. Aboral view. × 4.
2. Oral view.
3. Side view of four arm-segments. × 10.

PECTINURA CYLINDRICA (Hutton). Dunedin, N. Z.

4. Aboral view. × 4.
5. Side view of five arm-segments. × 10.

CRYPTOPELTA GRANULIFERA H. L. Clark. Mauritius.

6. Aboral view. × 4.
7. Oral view.

OPHIOCRYPTUS MACULOSUS H. L. Clark. Laguna Beach, Cal.

8. Aboral view. × 8.
9. Oral view.

AMPHIOPHIURA OEDIGNATHA H. L. Clark. Off St. Kitts, B. W. I., 208 fms.

10. Aboral view. × 4.
11. Oral view.
12. Side view of five arm-segments. × 10.

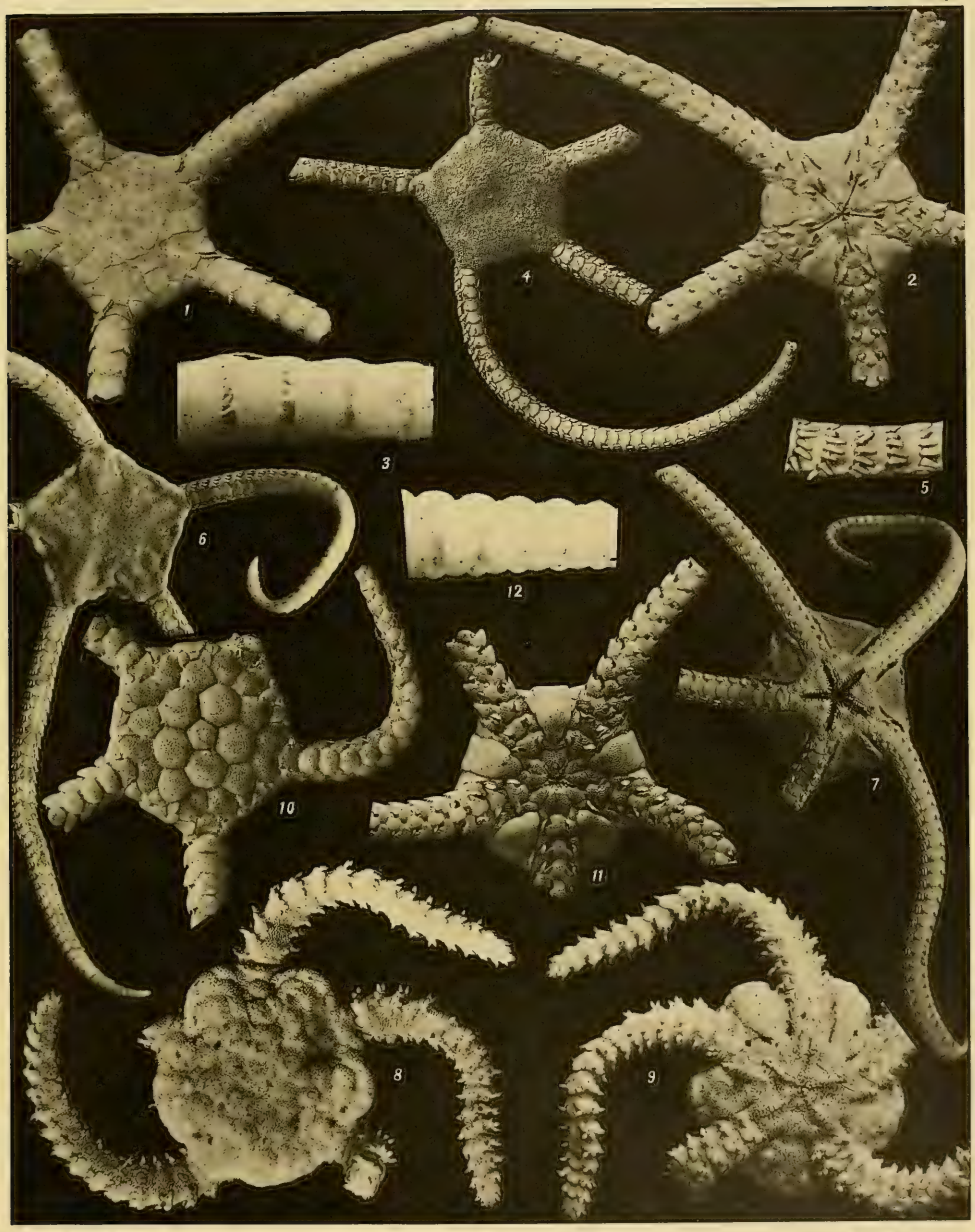

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PLATE 18.

PLATE 18.

Ophiarachna affinis Lütken. Samoa.

Fig. 1. Aboral view. × 1.3.
2. Oral view.

Ophiozonoida picta H. L. Clark. Wellington, N. Z.

3. Aboral view. × 8.
4. Oral view.

Ophiarachnella macracantha H. L. Clark. Ponape, Caroline Islands.

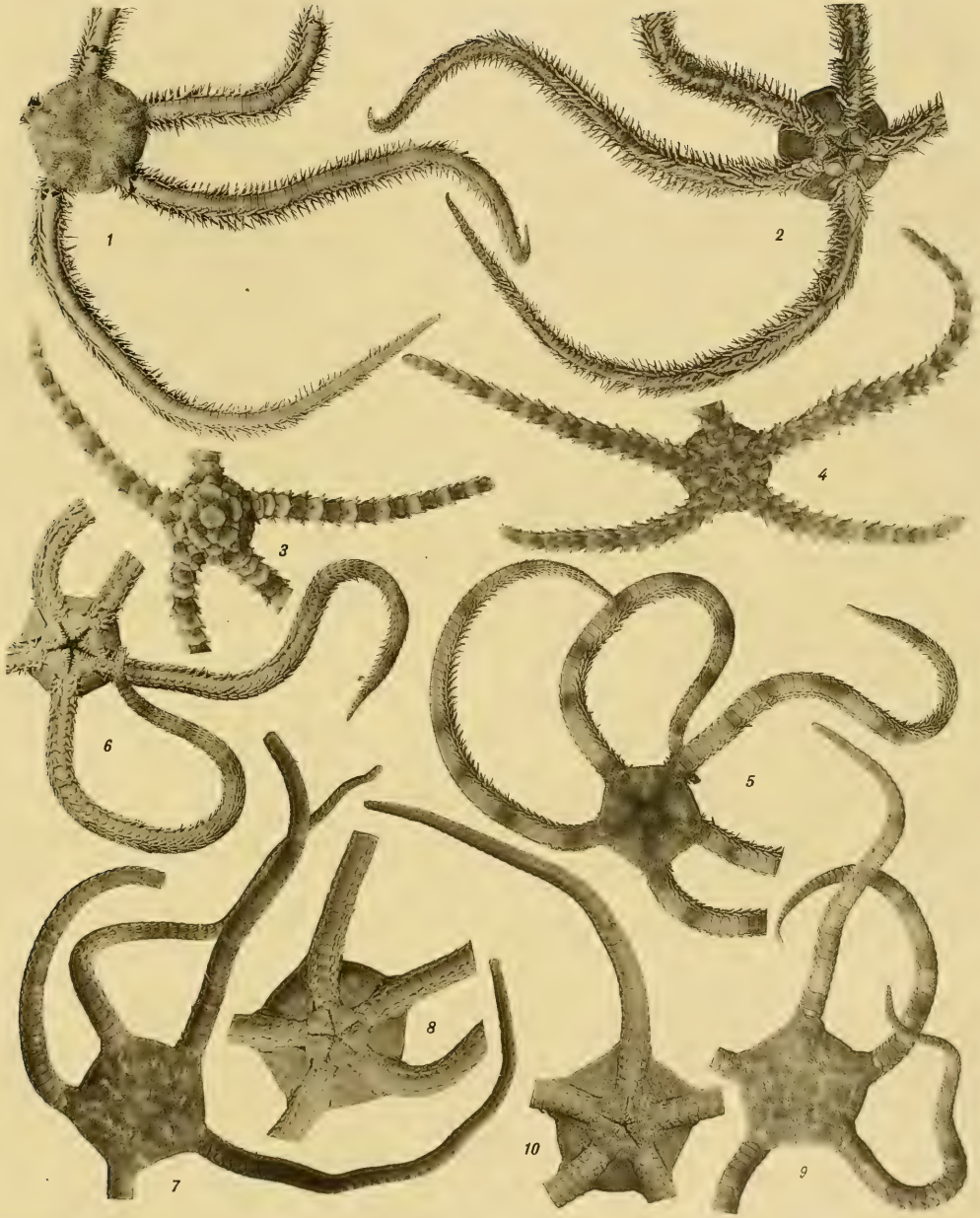
5. Aboral view. × 1.66.
6. Oral view.

Ophioderma variegatum Lütken. Aqua Verde Bay, Lower California.

7. Aboral view. × 2.5.
8. Oral view.

Pectinura fallax (Peters). Zanzibar.

9. Aboral view. × 2.
10. Oral view.



E. E. Nelson, photo

PLATE 19.

PLATE 19.

Ophiura multispina (Ljungman). Port Jackson, N. S. W.

Fig. 1. Aboral view. × 4.
2. Oral view.

Ophiura fraterna (Lyman). Southern Indian Ocean, 1950 fms.

3. Aboral view. × 1.6.
4. Oral view.

Ophiura hexactis (E. A. Smith). Royal Sound, Kerguelen.

5. Aboral view. × 1.5.
6. Oral view.

Stegophiura macrarthra H. L. Clark. Off Georgia, U. S. A., 233 fms.

7. Aboral view. × 5.
8. Oral view.

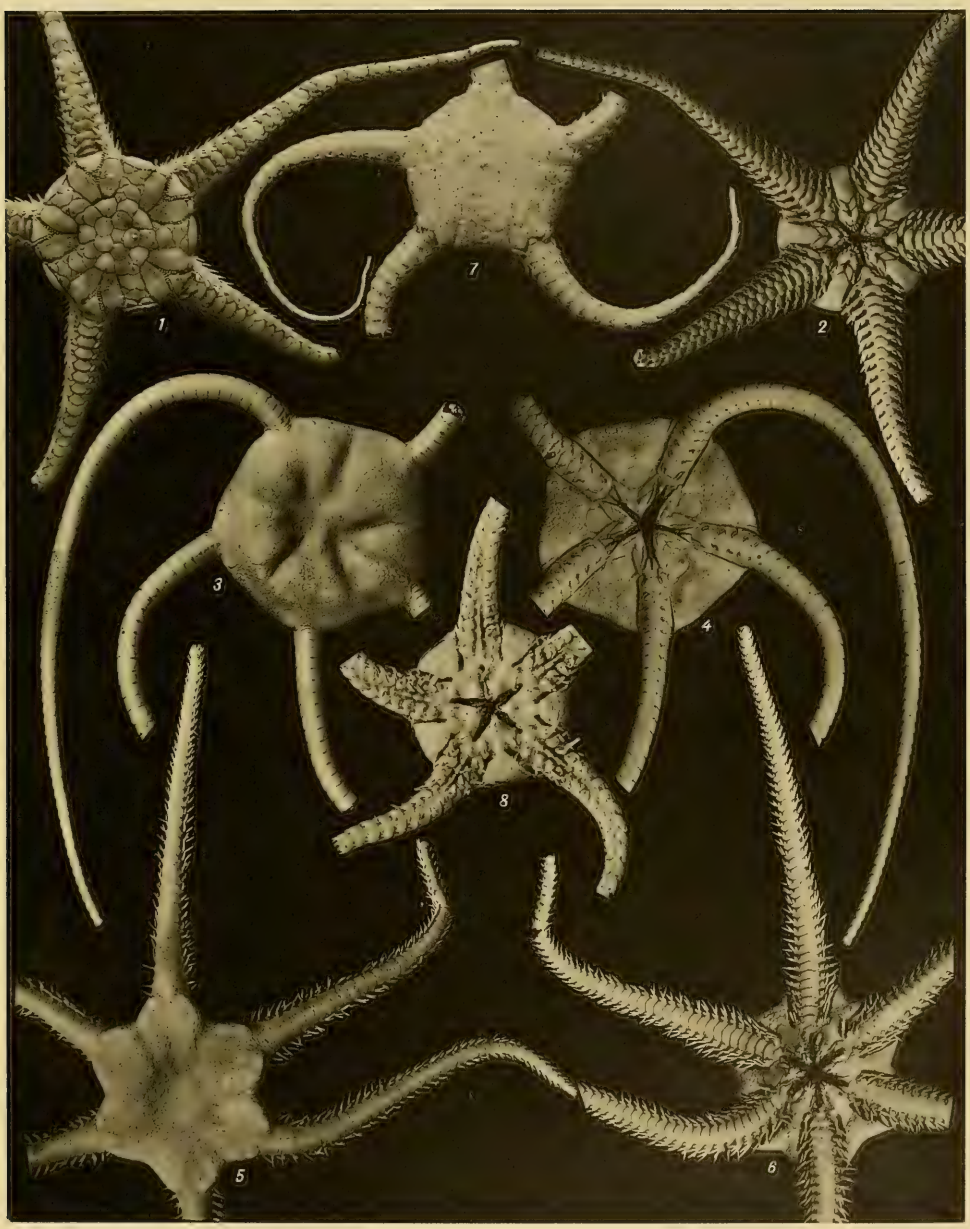

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PLATE 20.

PLATE 20.

AMPHIPHOLIZONA DELICATA H. L. Clark. Off Barbados, 103 fms.

Fig. 1. Aboral view. × 6.
2. Oral view.

HOMALOPHIURA INERMIS (Bell). Off Cape Adare, South Victoria Land, 26 fms.

3. Aboral view. × 3.5.
4. Oral view.

OPHIOZONELLA LONGISPINA (H. L. Clark). Uraga Channel, Japan.

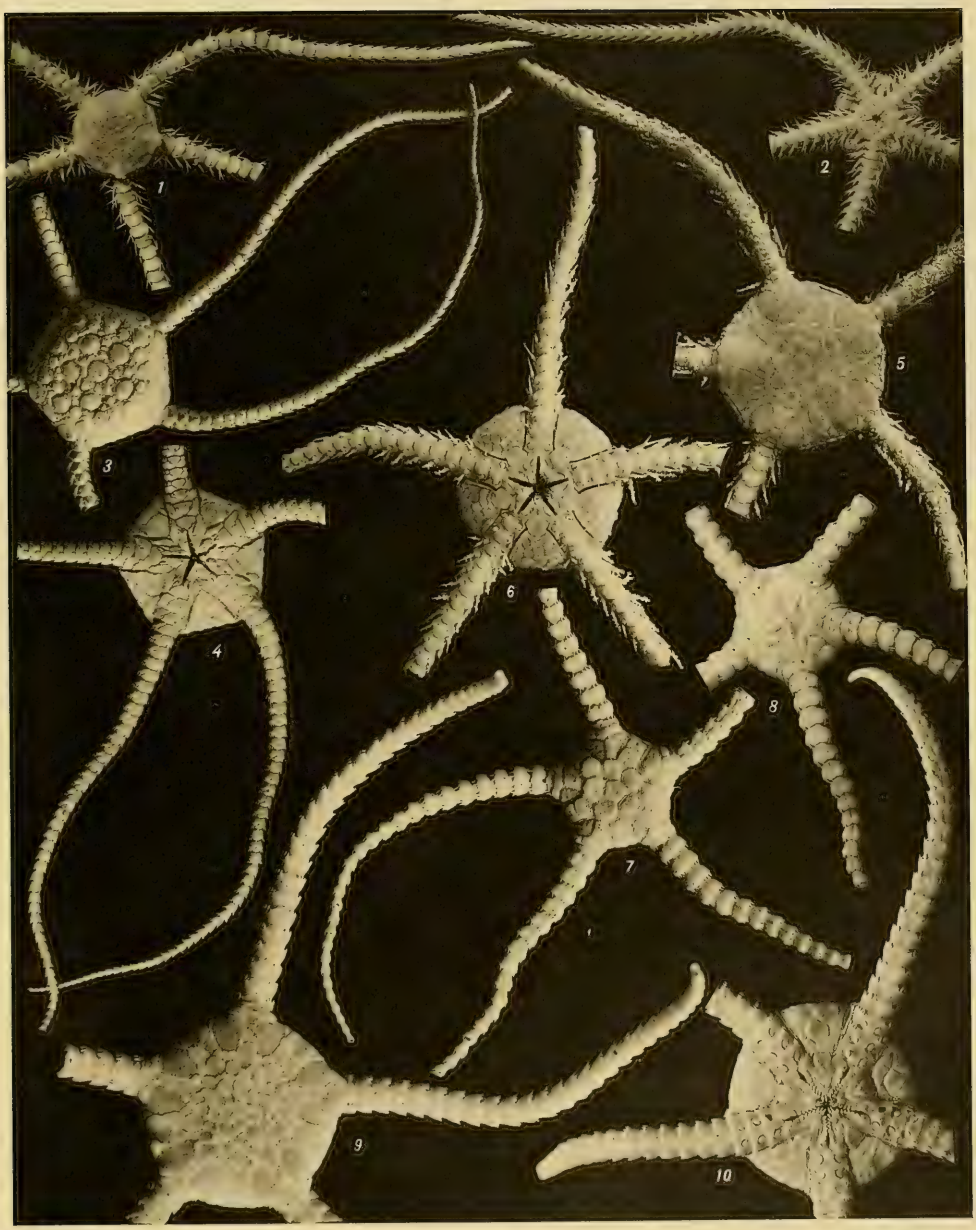
5. Aboral view. × 3.5.
6. Oral view.

OPHIOMUSIUM OLIGOPLACUM H. L. Clark. Off Havana, Cuba, 250–400 fms.

7. Aboral view. × 5.
8. Oral view.

OPHIOMUSIUM MONOPLAX H. L. Clark. Off Cabo Cruz, Cuba, 206 fms.

9. Aboral view. × 3.
10. Oral view.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